

MOTOR AGE

FOR AUTOMOTIVE SERVICEMEN

A CHILTON PUBLICATION

JUNE 1941

THIS ISSUE

• Cretes of General Service

Fred Sloane

• Bronze Welding in Camper Repair

• Indianapolis Race Results

Bob Hankinson

• Doctor Brake Service
Bob Turner

• Hundreds of Other Helpful and Profitable Ideas



MAURI ROSE TOPS INDIANAPOLIS QUALIFIERS

STILL SOCKING 'EM OUT OF THE PARK!

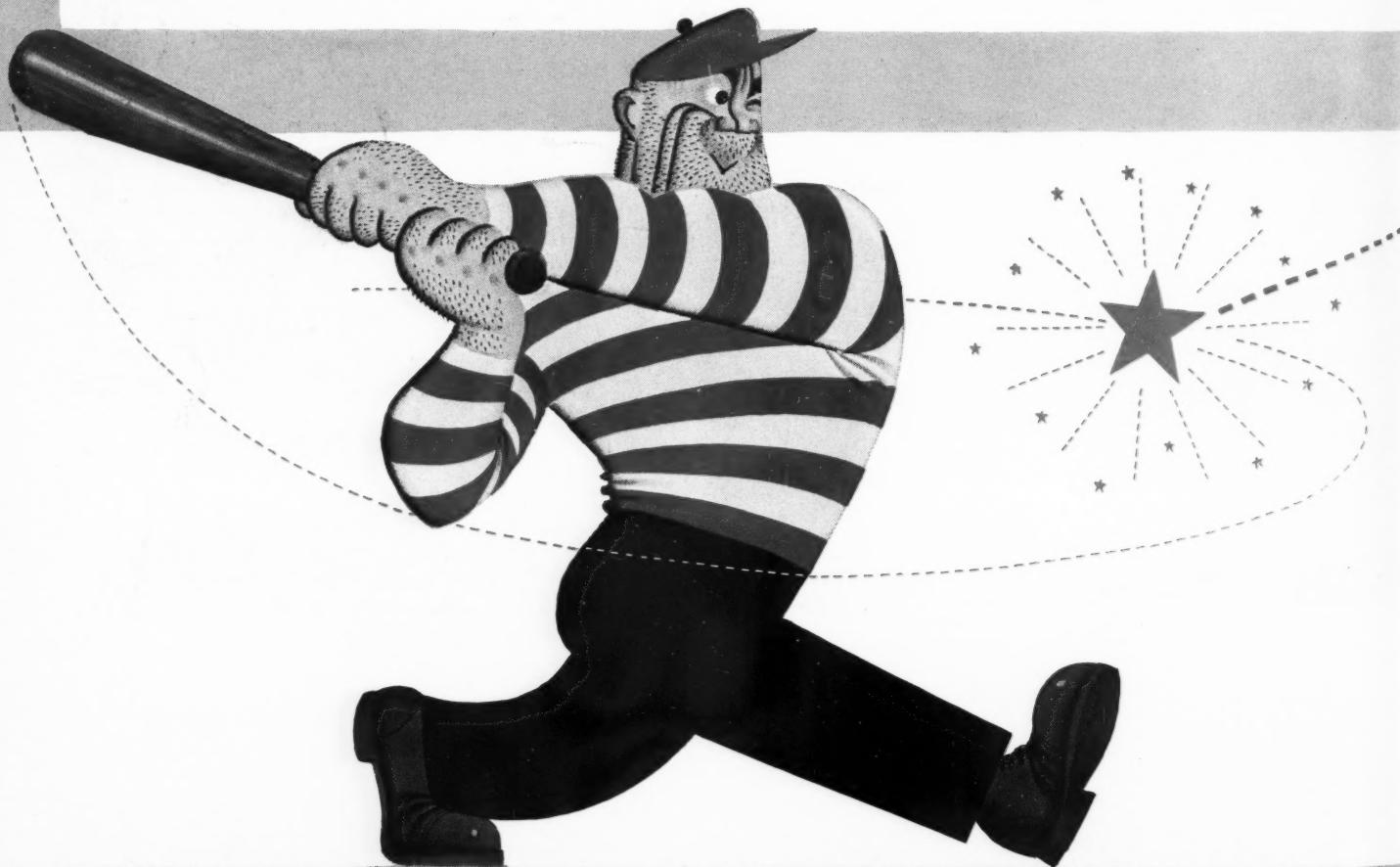
Without let-up Hastings Sales continue to rise. Each year since 1936 Hastings Sales have shown an increase over the preceding year... in some years more than doubling.

But the more homers you hit one year—the tougher it becomes to break the record the next. So we're especially gratified at this year's record

—which shows a healthy increase over last year's. The motor service man who today uses and recommends Hastings Steel-Vent Piston Rings enjoys the advantage of well-established car-owner acceptance.

HASTINGS MANUFACTURING COMPANY, HASTINGS, MICH.

Piston Rings • Piston Expanders • Valv-Rings



HASTINGS

STEEL-VENT PISTON RINGS

U. S. Patent Nos. 2,148,997, 2,175,409

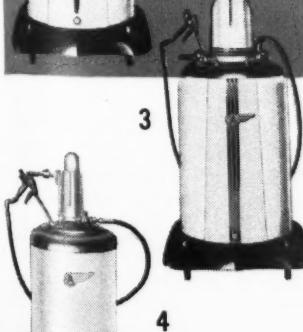
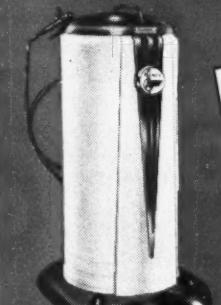
Stop Oil-Pumping • Check Cylinder Wear



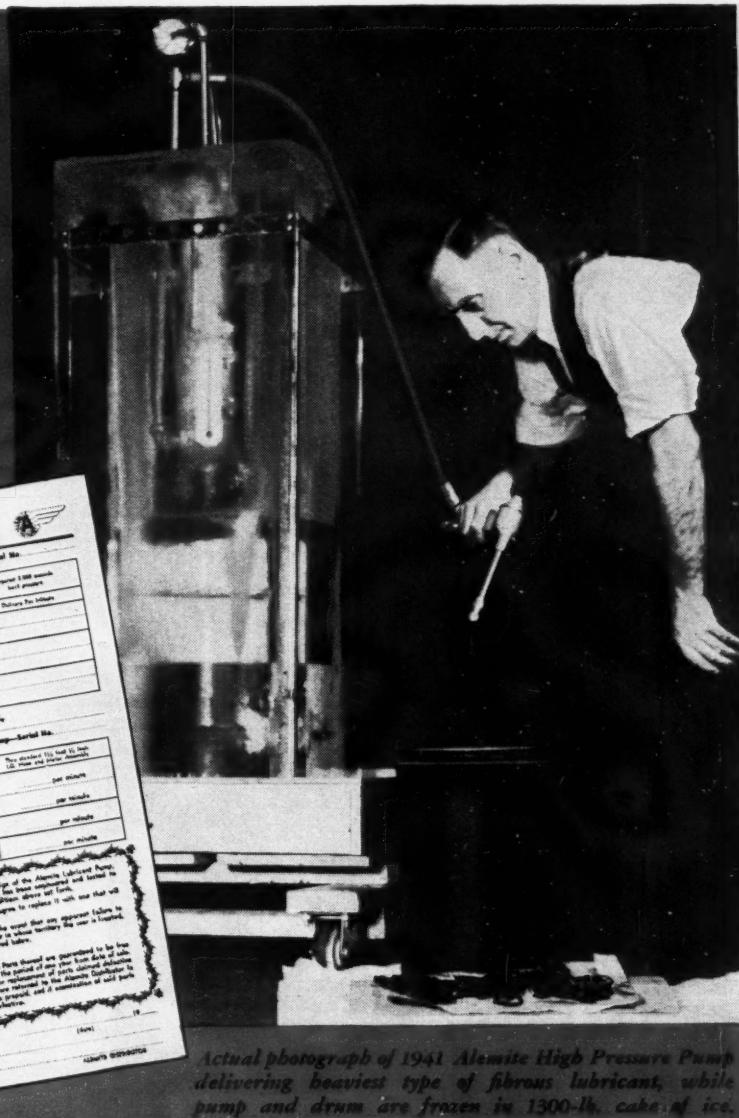
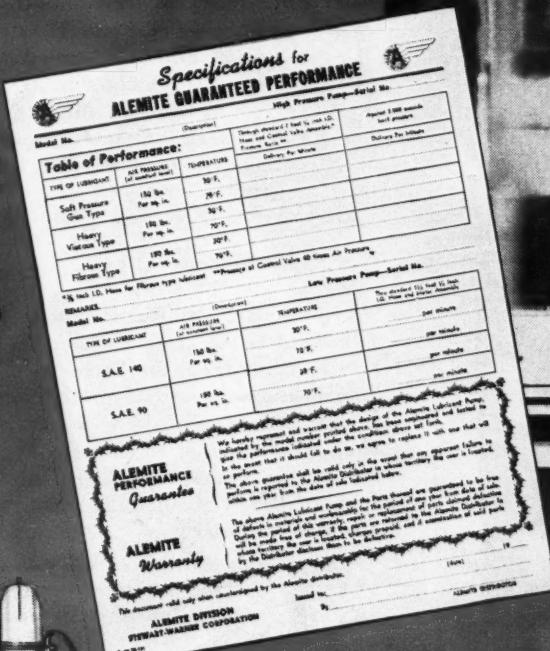
HERE'S ONE JUNE PROMISE THAT HOLDS GOOD IN DECEMBER!

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**Delivers Heavy Grease
EVEN WHEN FROZEN
IN A CAKE OF ICE!**



- 1. Super DeLuxe
- 2. DeLuxe
- 3. Master
- 4. Advance



Actual photograph of 1941 Alenite High Pressure Pump delivering heaviest type of fibrous lubricant, while pump and drum are frozen in 1300-lb. cake of ice.

SURE! Summer is the busy season. That's when equipment is needed. That's when equipment is bought. But it's comforting to know that the guaranteed 1941 Alemite Lubrication Equipment bought for the summer rush will be pumping heavy lubricants just as dependably when the middle of winter arrives!

That unprecedented Alemite Guarantee states exactly what Alemite Equipment will do—guarantees the performance of the specific pump purchased in terms of

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There's a size, capacity, and price to meet every requirement. All are offered on Alemite's convenient "Pay-As-You-Profit" plan. *Please Write or Wire TODAY!*

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ALE MITE

REG. U. S. PAT. OFF.





MODEL T-16

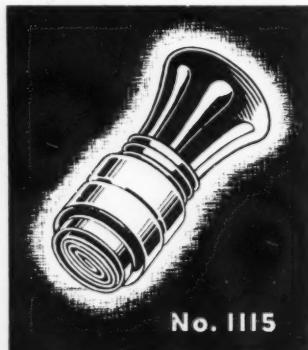
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Voltage Regulator
and Generator Test

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REPLACEMENT
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MOTOR AGE

With Which is Combined AUTOMOBILE TRADE JOURNAL
FOR AUTOMOTIVE SERVICEMEN

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MOTOR AGE

JUNE 1941

Tourist Business

A lot of us have been emphasizing the improvement in service business that is resulting from the increased driving that is being done by defense workers. Another factor, which hasn't received as much attention, but is of considerable importance when it comes to putting money in ye olde till, is the tourist business. This year will see a great many more people who will decide to see America first, if for no other reason than there is a bit of an argument going on in Europe.

Old Timer

An item on some old-time cars in a recent issue stirred Roy Main, of Auburn, N. Y., to do a little reminiscing about the Buick when it had a planetary transmission. Boy, I couldn't forget that job, as I learned to drive in one.

Scarce Parts

A lot of the mechanics in this neck of the woods are already complaining of the shortage of parts. Pins, rings, valves and even gaskets have been difficult to get in many instances. The shortage is not only on parts made of aluminum and zinc, but other metals as well. Which would seem to indicate that, before the war is over, many service men will have to find out how to repair cars without installing new parts. It's a good job, if you can do it.

Good, Better, Best

While not everyone agrees with me on the swell job MOTOR AGE is doing, still we must be considerably better than good when a Ford



SHOP TALK

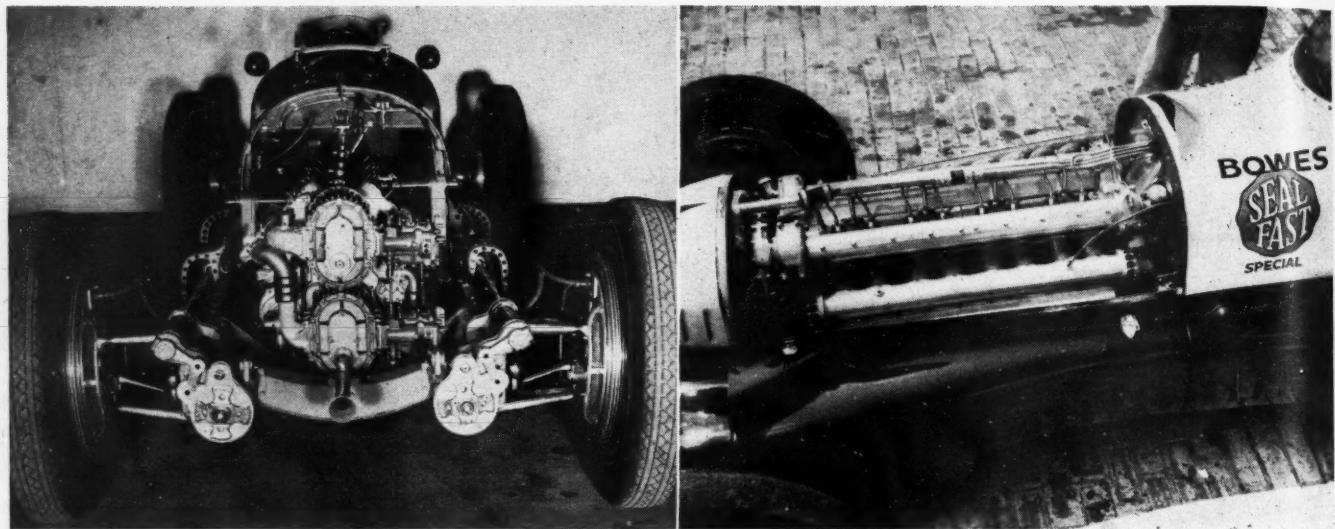
By *Bill Tobolsky*

dealer in Louisiana writes in to compliment us on the article on reconditioning Ford engines, which appeared in the May issue, and wants some more details.

Lunch Time

After pointing out that, through an error he had received two copies of the April issue of MOTOR AGE,

E. W. Symns, whose letterhead says he is a farm mechanic in Cherokee, Okla., goes into some detail on a personality course he is taking. E. W. states that we do what we do because of hunger, heredity or environment. The last two are ten-dollar words, which I don't know much about. But the first, that's something else, and I'm going out to lunch.



This is the same car and engine with which Wilbur Shaw won last year. The 177 cu. in. engine is supercharged.

Rex Mays drove this 179 cu. in. supercharged engine into second place, averaging 114.459 m.p.h.

THRILLS from start to finish featured the 29th running of the Indianapolis 500-mile race, ending when Mauri Rose flashed across the finish line and received the checkered flag to win the race with an average speed of 115.117 miles per hour. Rex Mays drew second place money with an average speed of 114.459 miles per hour, with Ted Horn taking third place at a speed of 113.824 miles per hour.

Rose took over Car No. 16, which started the race with Floyd Davis in the driver's seat, at the 180-mile mark after his own car had been forced to drop out due to spark plugs fouling. No. 16 was then somewhere in the pack—not even among the first 10—but Rose went to work and, by skillful and consistent driving, worked his way up past car after car, taking the lead at the 405-mile mark. At no time after that was his lead seriously challenged. While the winning speed fell short of that set by the late Floyd Roberts in 1938, it, nevertheless, was a fast race when traffic permitted, and will rank well up with any other in the history of the 500-mile classic.

High tribute is due Cliff Bergere, driving the same car with which the late Floyd Roberts won the race in 1938, and in which he was killed in 1939. Bergere drove the entire race without a single stop, wheeled his car into fifth place at an aver-

MAURI ROSE

Taking car first driven by Floyd Davis when his own car fails, he brings it from behind with spectacular rush to score first triumph in 500-mile race

By BOB HANKINSON

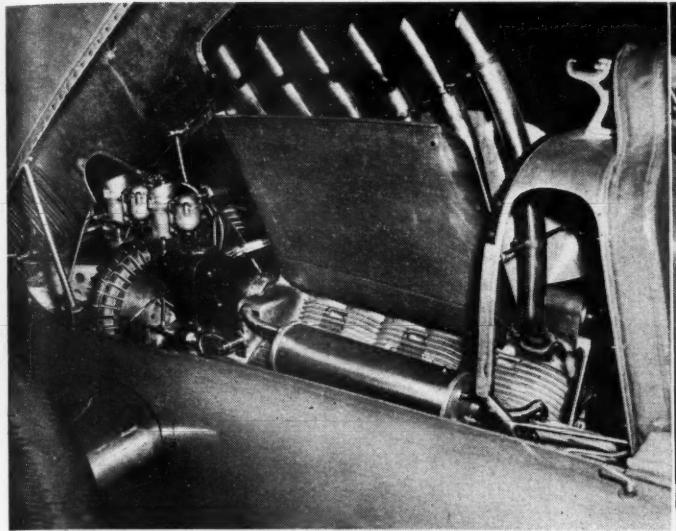
See Page 40 for specifications and performance data

age speed of 113.528 miles per hour, and then all but collapsed in the cockpit.

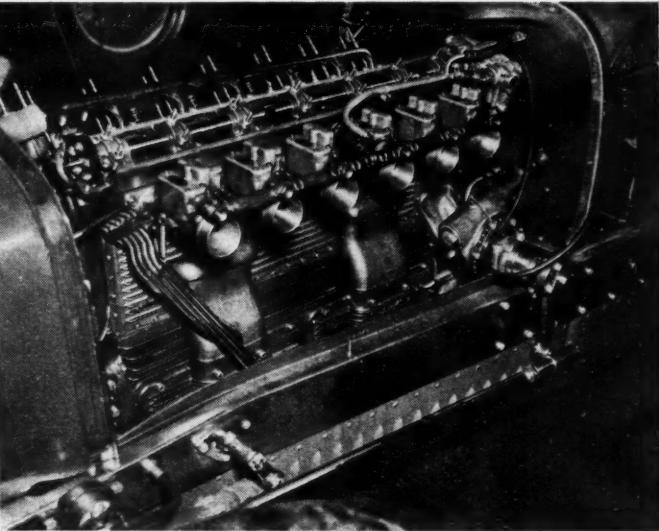
The race started off at a fast pace and there was every indication that it would be a record-breaker, but the fates decreed otherwise. In the fifth lap, cars Nos. 5 (Joe Thorne), 19 (Emil Andres), and 53 (Louis Tomei) figured in a crack-up which left the first two wrecked so badly that they

were unable to continue, and No. 53 limped to the pit with a right front tire hanging on the rim. This car went back into the race, and finished eleventh. Fortunately, neither Thorne nor Andres was seriously injured.

The caution flag was displayed until the wrecks and the spilled oil could be cleared off the track. Rex Mays was leading the field at the time the wreck occurred. After the



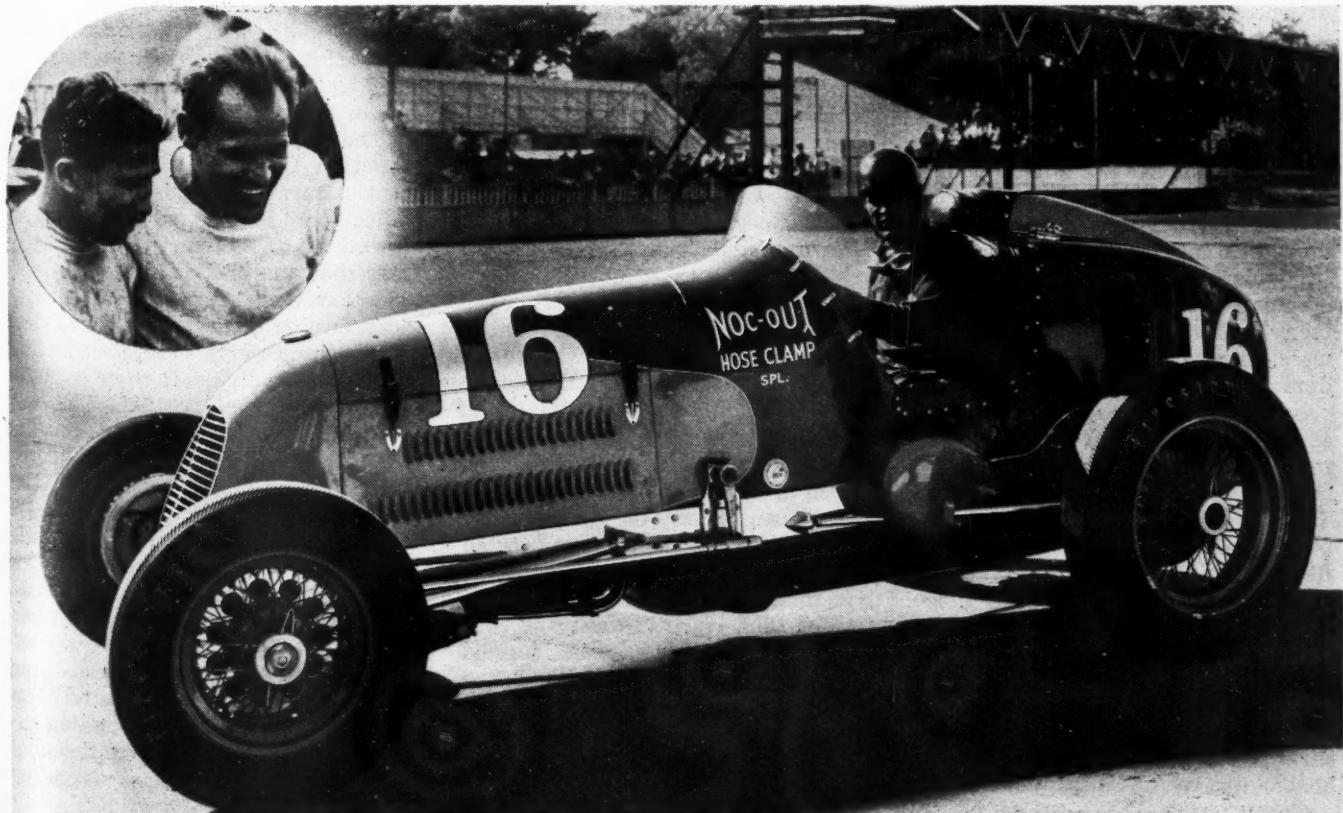
This four-wheel drive job, with Al Miller at the wheel, went out after 22 laps because of transmission trouble.



Joe Thorne in this six-cylinder job cracked up in the fifth lap. Note the arrangement of the six carburetors.

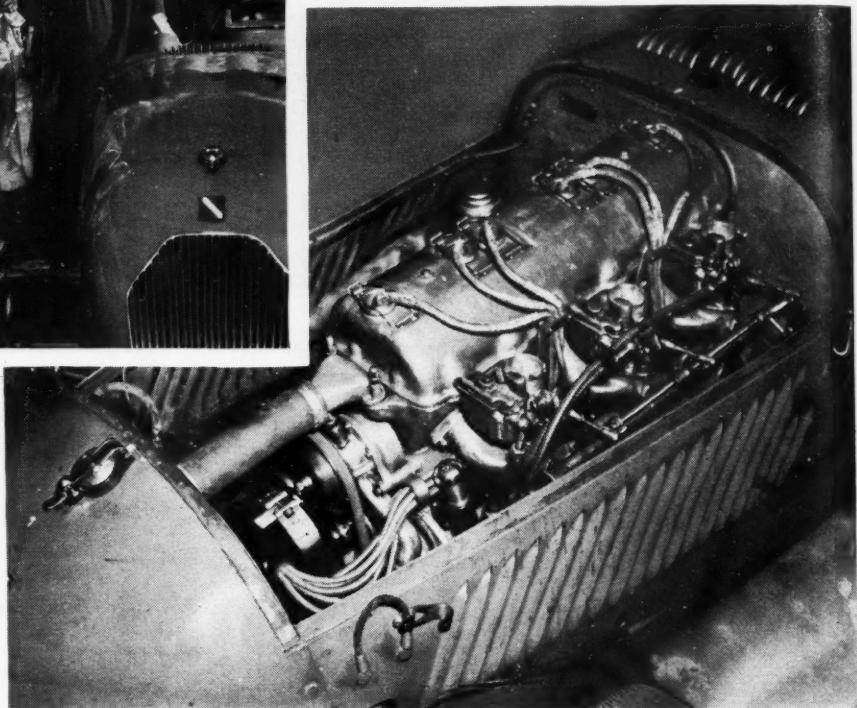
WINS AT INDIANAPOLIS

Winning car, which was qualified by Davis (at wheel), at 121.106 m.p.h. Rose, left, and Davis are shown in insert.





The two Talbot cars arrived in this country on Sunday before the race but were too slow to qualify. The drivers, Trevoix (left), and LeRegue (right), are shown between the two cars.



all-clear signal was given at the 35th lap, it became a three-way fight for the lead, and at the 100-mile mark it was Rose, Shaw and Mays in that order. By the time the 125-mile mark was reached Shaw had passed Rose. Then at 377 miles a broken wheel sent Shaw spinning into the wall.

Rose, in the meantime, had taken over Davis' car, and had been bringing it up out of the pack, to tail Cliff Bergere who was then running in second place, Mays having dropped back to third. Bergere went into the lead when Shaw crashed, but Rose had regained the lead by the time the 405-mile mark was reached, and never lost it.

From a mechanical viewpoint, the cars which faced the starter's flag this year were, with one exception, practically the same as last year; no radical mechanical changes were in evidence. There were nine 8-cylinder cars, six 6-cylinder, sixteen 4-cylinder (car 28 having been wrecked the evening before the race during a tune-up run) and one 16-cylinder. Twelve cars used superchargers, the centrifugal type being found on the eight American-made jobs, with the foreign entries using the Roots type. Only one of the 4-cylinder cars, the Gilmore Red Lion Special, entered by Leon Duray and driven by George Robson, was equipped with a blower. It was the centrifugal type, mounted at the front of the engine and driven by bevel gears from the crankshaft. Two downdraft Miller carburetors were mounted at the blower intake.

Twenty of the cars were equipped

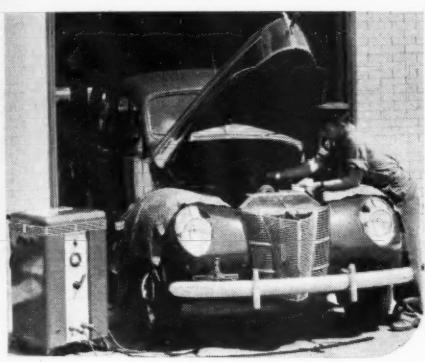
with Perfect Circle piston rings, 12 with Burd rings, while the Sampson Special was equipped with American Hammered rings. Champion had all the spark plug equipment with the exception of three cars, the two Bowes Seal Fast jobs used Bowes plugs and the Blue Crown Special, of course, used Blue Crown plugs. The three Maserati jobs retained their original Scintilla magneto equipment, while all the rest had Bosch magnetos. Packard ignition cable was found on all cars, while New Departure bearings, Firestone tires, and Double Diamond rear axle gears also enjoyed practically a clean sweep in their respective fields.

Fourteen cars elected to use alcohol blend fuel this year, and this necessitated some changes in gas tanks to carry a larger quantity of fuel, since the average consumption of alcohol blend fuel is around four miles per gallon. The alcohol blend consisted mainly of a mixture of approximately 80 per cent methanol, 17 per cent benzol, and 3 per cent acetone. The gasoline blends were approximately 80

per cent gasoline and 20 per cent benzol, with lead added to bring the octane number somewhere in the vicinity of 108. Compression ratios were about 15 to 1.

The service man will be interested in Car No. 44, qualified by Lewis Durant at a speed of 116.152 miles per hour, and which was forced out of the starting line-up by cars that qualified at higher speeds. This car was equipped with a Mercury engine mounted in one of the Ford front-drive racing chassis which originally made their appearance at the track in 1935. The engine was mounted in the chassis with the flywheel toward the front, and a Bosch magneto replaced the original equipment distributor. A special intake manifold was made to accommodate the two Stromberg downdraft carburetors, which made it necessary to cut two holes in the top of the hood to allow the carburetor air horns to project. The car appeared to handle nicely on the track, but was outclassed in speed by the engines built especially for racing service.

(Continued on page 132)



It enables this shop to meet the demand for quick service and thus triple its volume

FAST CHARGER SPEEDS UP

BATTERY BUSINESS

BATTERY service and sales at the Tom Turner Service Station at Ridley Park, Pa., last winter enjoyed a boom. During December, January, and February, the shop recharged 154 batteries. That was just 96 more jobs than had been done in the corresponding period a year before. Besides, the shop, which does a general service and repair business, sold almost three times as many new batteries.

The reason for this extraordinary leap in service and sales was not hard to find. In November, Turner purchased a fast charger, and his battery business began its upward surge almost as soon as the unit was delivered. Before the peak battery season passed, the fast charger had paid for itself with the extra business it had created.

Most of the revenue came from increased battery sales, even though recharging seemed the more likely source of new business when the charger was bought. In actual use, the charger gives Turner every chance to demonstrate to an owner of a defective battery that the unit should be replaced with a new battery.

Formerly, it was hard to convince a car owner that his battery was dead or gasping. Even after the tester had shown a defective cell, the owner usually insisted on hav-

ing it put on the line. Recharging would bring it up somewhat and more often than not the owner would have the old battery put back in the car. When it failed later, he would be far from the shop that serviced it, and all the shop made out of the transaction was the rental on the service battery and the price of recharging.

With the fast charger, the owner has little chance to stray off to another shop. His old battery can be recharged almost immediately and,

(Continued on Page 73)

REPAIRING broken automobile bumpers has heretofore been a difficult and costly operation, and not a very satisfactory one insofar as restoring the strength of the bumper was concerned. A new method is now being used, one which is quicker and cheaper, and which restores the bumper to its original strength. Any shop equipped for oxy-acetylene welding can do this job with the materials listed.

The first step is to grind the back of the bumper to remove the chromium plating for a distance of about $1\frac{1}{2}$ in. on each side of the break. Wire brush the edges of the break to remove dirt and rust. Then line up and tack-weld the parts at the outer edges to hold them in place as shown in Fig. 1 and Fig. 2.

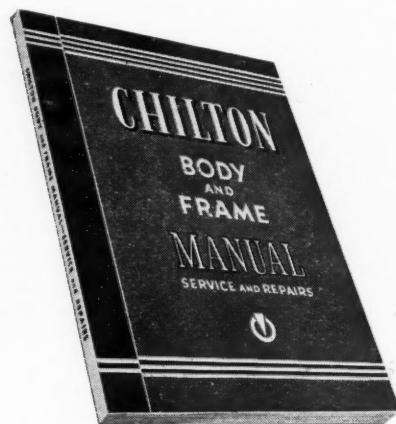
Then take the $2\frac{1}{2}$ in. splint of $\frac{5}{16}$ in. steel rod and join the end of a $\frac{1}{8}$ -in. bronze rod to it to help hold it in position, and tack-weld it across the break in the center of the bumper. Then tack-weld the two shorter splints in place as shown in Fig. 3.

Bronze weld each of the three splints to the back of the bumper as shown in Fig. 4. Be sure to work the bronze under the roll of the splint on each side and build up a 45-deg. fillet. Fig. 5 shows a cross-section view of the position of the splints, and the fillets built up on each side of the splints.

Next make a butt type bronze weld the full length of the break, working the bronze into the fracture as much as possible. Build this up to about $3/16$ in. thick and 1 in. wide, as shown in Fig. 6.

Clean up the bronze weld in the usual manner, and buff the front side of the bumper to remove the discoloration.

If a careful job of bringing the break together is done, and the weld is made neatly, the repair will not be noticeable from the front.



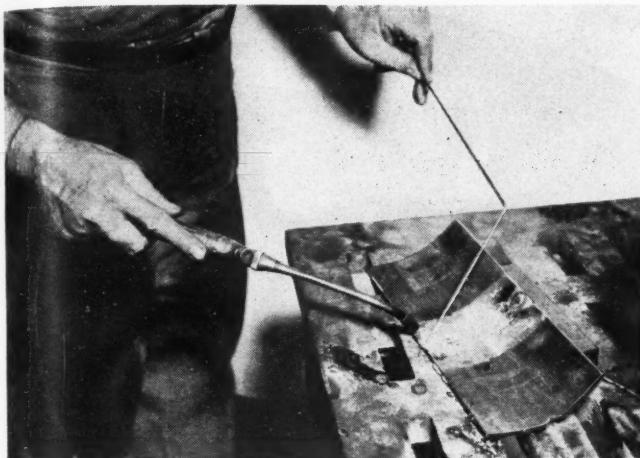
This article, and others in Motor Age, supplements the service information incorporated in the Chilton Body and Frame Manual.

BRONZE WELDING IN BUMPER REPAIRS

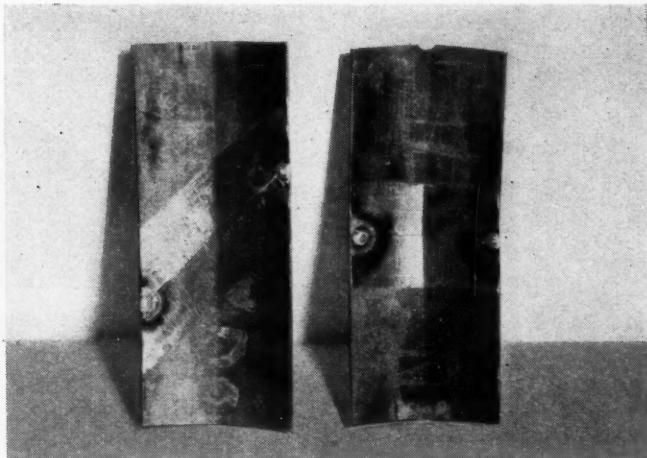
A new method of repairing bumpers that is quick yet restores original strength

MATERIAL NEEDED

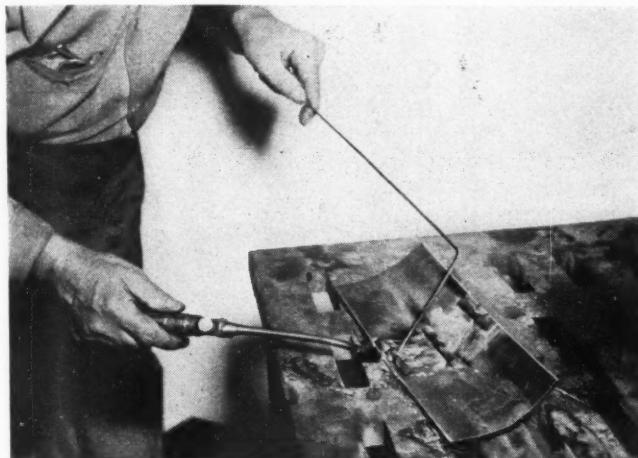
Oxy-acetylene outfit with W-15 blowpipe and No. 4 tip . . . No. 25 bronze welding rod, $\frac{1}{8}$ in. and $3/16$ in. . . . Brazo flux . . . $5/16$ in. No. 1 high test steel welding rod: one piece $2\frac{1}{2}$ in. long and two pieces 2 in. long.



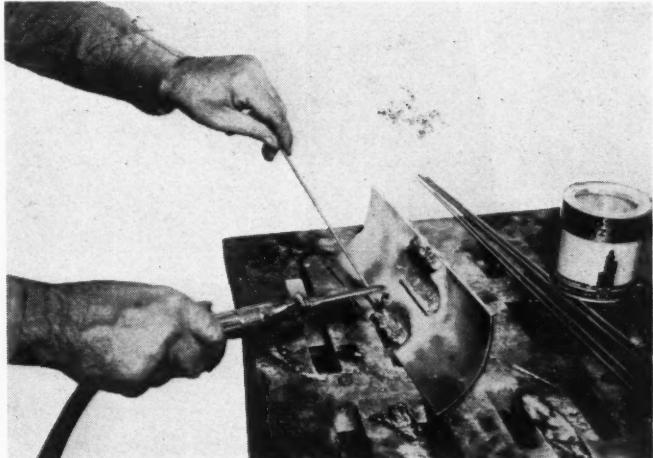
1. Grind the back of the bumper to remove the chromium plating over a width of about $1\frac{1}{2}$ in. on each side of the break. Then line up and tack-weld the parts.



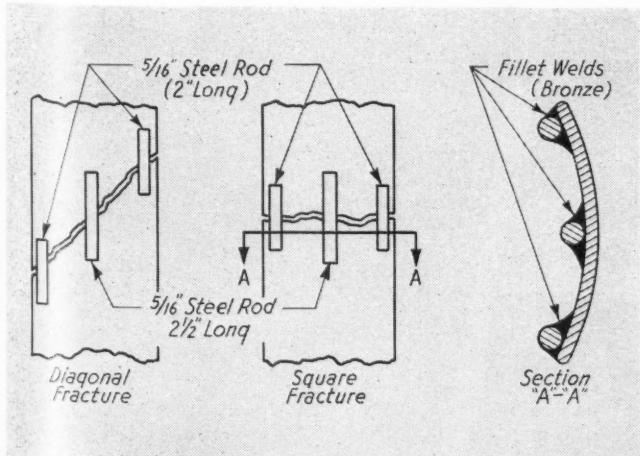
2. Make the bronze tack-welds at both ends of the break, but as the metal is rather thin the welds need not be "veed". Be careful to bring the edges of the break together tightly.



3. Place the center splint in position and tack-weld it in place. Then tack-weld the other two splints in place near the outside edges of the bumper.



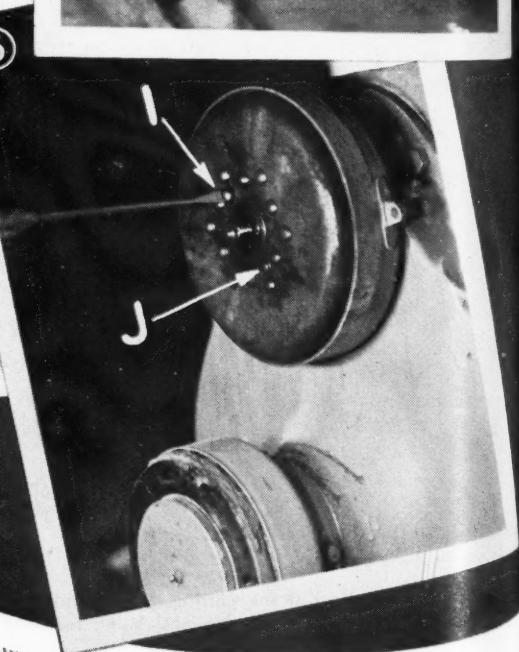
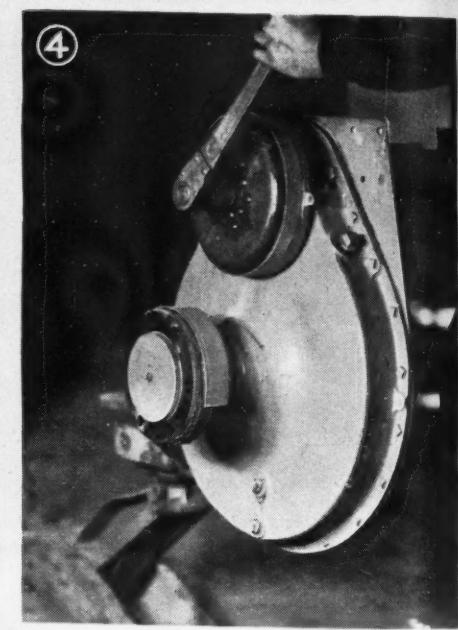
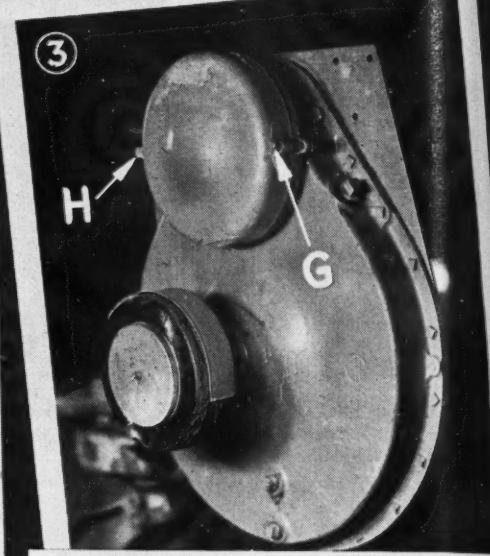
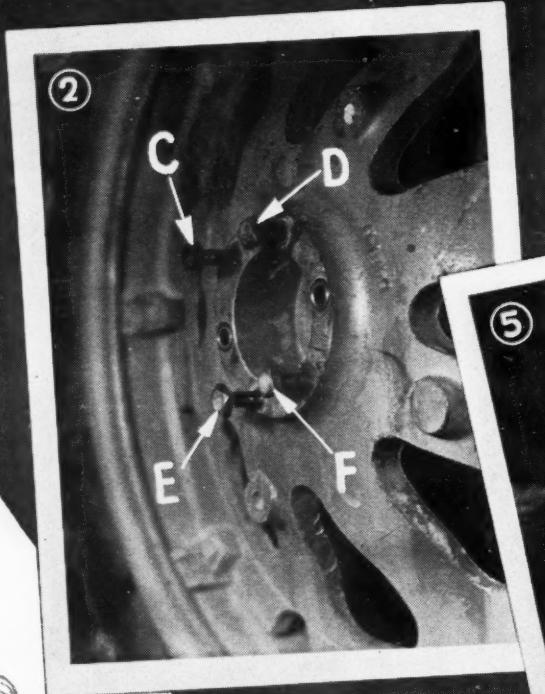
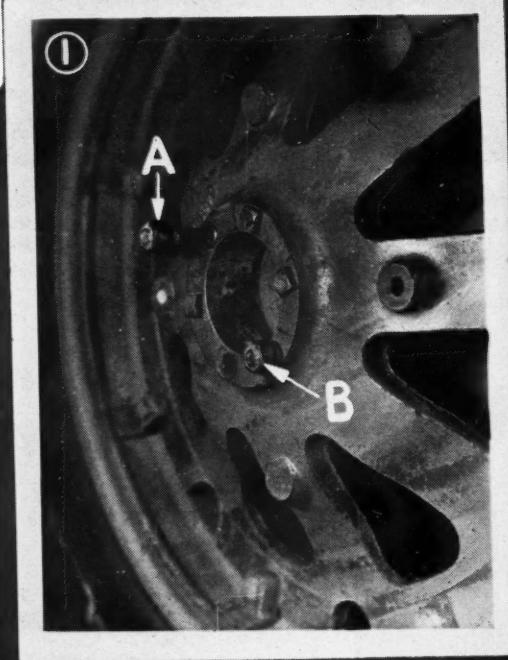
4. Work the bronze under the roll of the splint on each side, using the $\frac{1}{8}$ in. rod, and build up 45 deg. fillets on each side of each splint. Good workmanship at this point results in clean looking job.



5. Cross-section view of the positions of the splints and the fillets build up on each side of the splints. Using the long splint in the center.



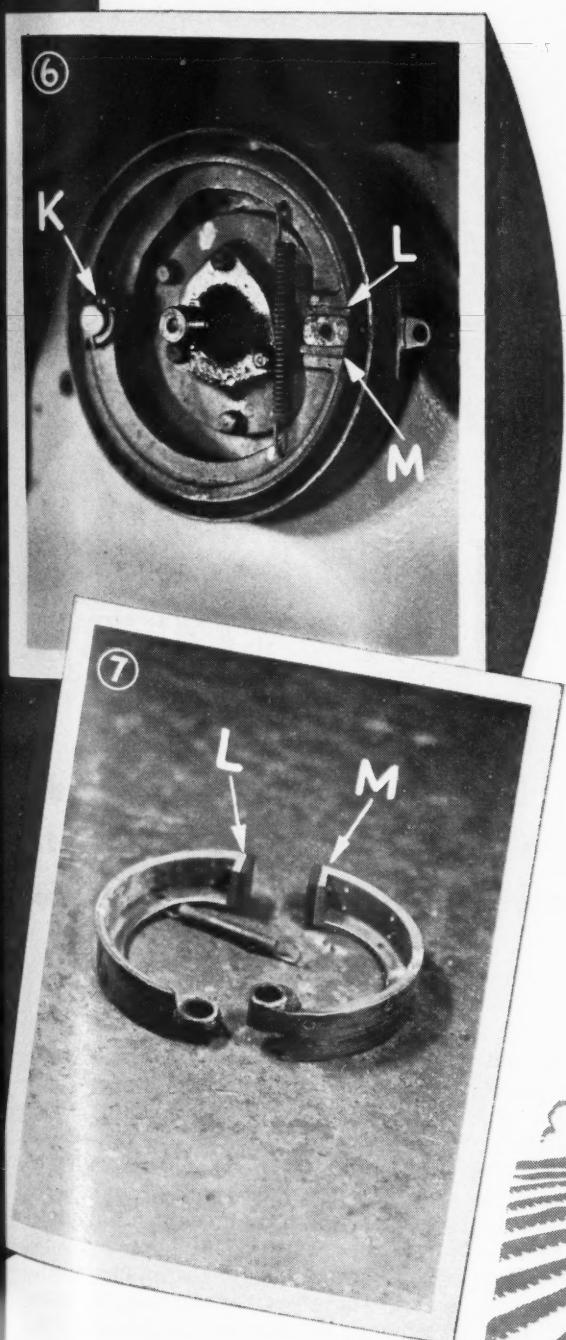
6. Butt-weld the break, using the $3/16$ in. bronze welding rod, and build the weld up to about $3/16$ in. thick and 1 in. wide. Buff the front of the bumper to remove discoloration.



TRACTOR BRAKE SERVICE

Relining and adjusting brakes on Farmall Tractor Model F20

By BOB TURNER



1. Remove the two driving pins "A" and "B".
2. Remove the four wheel retaining studs "C", "D", "E" and "F" and remove the wheel.
3. Remove the two bolts "G" and "H" that hold the brake drum dust cover in place and drive the dust cover off.
4. Remove the brake drum retaining nut from the end of the axle shaft.
5. Remove the two screws at "I" and "J" and replace with two cap screws approximately 3 inches long. Turn up these two cap screws and force the brake drum from the shaft.
6. To remove shoes, pull cotter pin at "K" and remove the spring.
7. Old lining may now be removed from shoes and new lining installed. Brake shoe adjustment is accomplished by adding or removing shims at points "L" and "M".





160 LUBRICATION JOBS

come pretty close to setting a record. Can your own lifts equal it? If not, you'll get some ideas from this article

MUCH has been written about the plus value of a lubrication department to a service shop. Over and above the business done at the lifts, the lubrication department has been considered an excellent feeder for the rest of the shop and, therefore, of vaster importance to the operation as a whole than its volume might indicate.

Lubrication lifts are unquestion-

ably excellent business getters, yet this fact is no reason to overlook their value as business doers. If the argument needed a clincher, the success of the Judge Motor Corp., of Rochester, N. Y., with its lubrication department, ought to do the job.

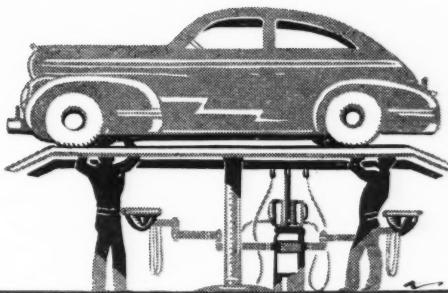
Starting in 1930 with facilities for only six cars at one time, the lubrication department can now

handle 15 cars at once. Last year the department wrote 50,902 orders, or 160 per working day and grossed \$106,000.

Behind this remarkable growth and no less remarkable volume are to be found a number of highly important factors. The department is kept scrupulously clean and neat, and, therefore, attractive to customers. A number of inexpensive



A DAY



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AGE

yet highly appreciated services, such as wiping off the car, cleaning the glass and vacuum cleaning the floor mats, are included free with each lubrication. Finally, every one of the 32 men employed in the department is paid on commission instead of salary. It is to his financial advantage to sell as much and as complete lubrication as he can without high-pressure customers.

The scale of payments is set at a level to permit the men to make fair wages and at the same time to enable the department to show a substantial profit. The men receive 20 to 60 cents for each lubrication job, depending on the size of car and the price to the customer, 10 cents a pound on gear oil, and 2 cents a quart on engine oil.

The significance of this method

of payment is illustrated by the boost given the sale of motor oil in the last few years. In 1937, only 38 per cent of the customers who bought chassis lubrication also were sold an oil change. Last year, better selling had lifted the percentage to 57. The result was that customers bought 30,000 gal. of motor oil in 1940, nearly 10,000 gal. more than they would have bought had the percentage remained the same as in 1937.

Aside from the sale of lubricants, the lubrication department has become an outlet for numerous supplies and parts. The men are constantly on the lookout for defective or missing lubrication fittings, and replace hundreds in the course of a year. Spring repacking, air-filter cleaning, and clutch oil refills further bolster the department's volume.

The determination to deliver only first-class jobs has induced the shop to install every piece of equipment needed to attain that goal. There is a car-rocking jack for every one of the 15 cars that can be lubricated at one time, oil-filter cleaners, and a steamer for removing the dirty grease in transmissions and differentials.

Despite the department's concentration upon getting all the lubrication work it possibly can and showing a highly satisfactory return on its effort, it still has the opportunity to promote work for the remainder of the shop. Lubrication men are always alert to the mechanical needs of customers' cars and persuade a good percentage of owners to let the mechanical department look over the cars before taking delivery.

According to A. R. Loomis, shop manager, who insists there is no secret to the success of the lubrication department but who is kept much too busy to answer queries from other shops concerning it, 15 per cent of the shop's volume of repair and service business can be traced directly to suggestions made to owners who had brought in their cars merely to have them lubricated. The class of work originating in the lube department has been wholly responsible for the shop's installing two departments in the last couple of years. Previously, volume had been too slight to enable separate departments to pay their way.

By any analysis, however, the Judge lubrication department is able to stand on its own feet, for it makes a business of lubrication.

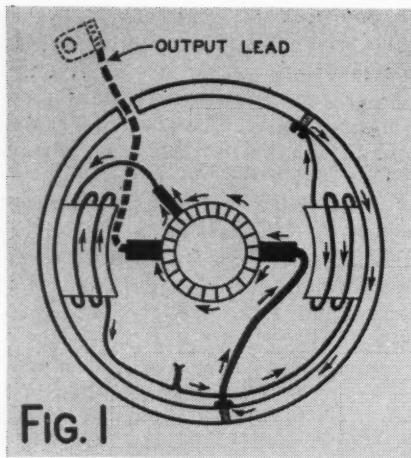


FIG. 1

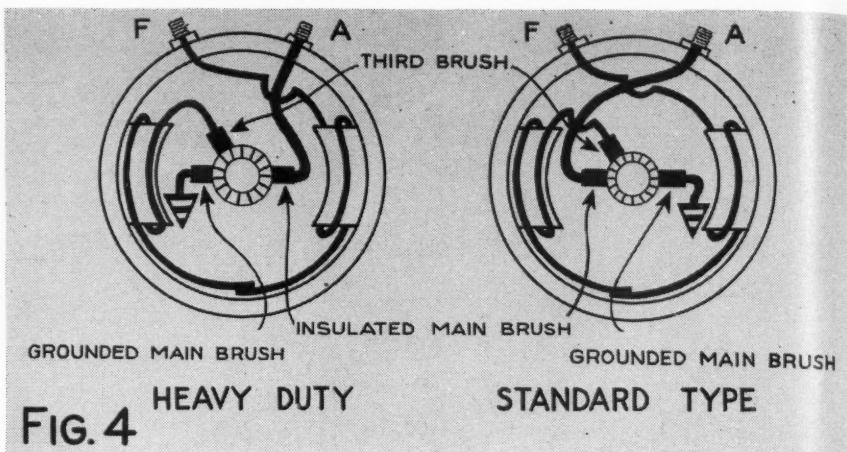


FIG. 4 HEAVY DUTY

STANDARD TYPE

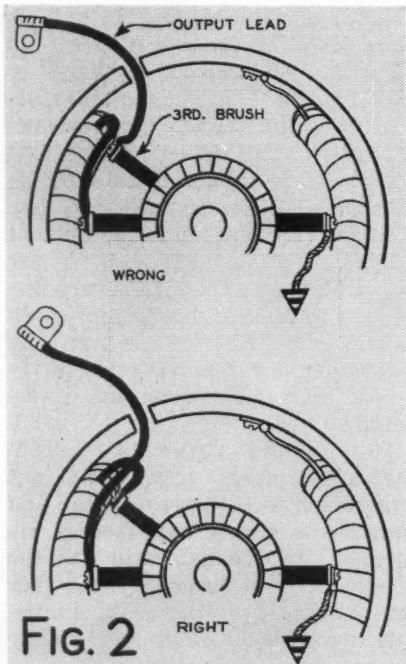


FIG. 2

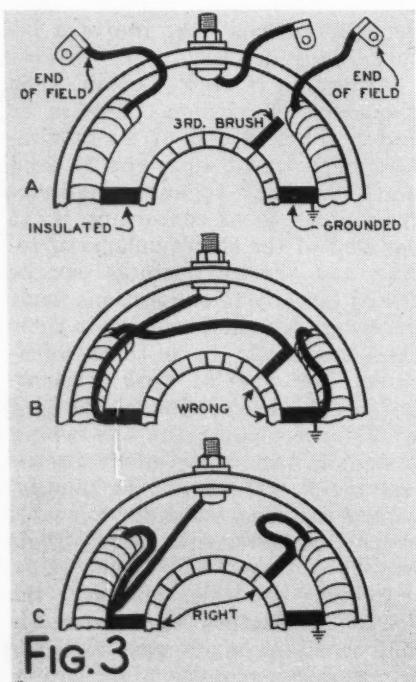


FIG. 3

SPLASH, the colored car washer, was moving chairs into place in front of the blackboard when Sam arrived at his shop. Sam owned Greenwood's newest and best service station, and he attributed a good share of his success to these evening skull practice sessions with the boys. Few men, Sam had long since discovered, know too much about their trade but altogether too many know too little.

Sam draped his coat and hat over his office chair and hurried over to the tune-up corner of the building. He counted faces and found all the shop force present but Archie Roe. That was all right; Archie kept abreast of the times by reading his trade papers from cover to cover, and missing out on one session wasn't going to do him any lasting harm. Besides he had a good excuse; the Roes were expecting, and Archie was probably over at the hospital right now.

"Tonight I want to talk to you boys about generators," Sam began. "There's been some big changes made in automobile generators in the last few years, and I'm absolutely certain that *some* of you haven't been keeping up with the times. Don't ask me how I know. For a good many years, we got along with the simple third-brush type of shunt generator, and almost any handy man soon learned how to

adjust the charging rate by shifting the third brush back and forth. Then along came the lamp load generator, the split-field type, and still later the voltage-regulated type sprang into use. Today most of the best jobs carry a high output two-brush generator with both voltage and current control.

"Tonight I'm going to stick to the old plain third-brush type," Sam told the gathering. "In spite of the fact that it's been used for years, there are some of you that can still stand to learn a few things about them. Just last week one of you sent a generator out of here with the wrong internal connections and almost burned it up. Besides there are still plenty of them in use and there will be for a long time to come. I've always believed that a fellow can't handle a complicated generating system until he has the easy ones down pat, so hear goes.

"One of the most important things to remember about the third-brush generator is the fact that, while it has three brushes, only two of them are necessary to generate current. These two are the grounded main brush and the third, or movable brush. What's the matter Harry, don't you go for that? Well, hang on to your shirt tail and I'll prove it to you. Every bit of current is generated in the armature, and all that's necessary to do that

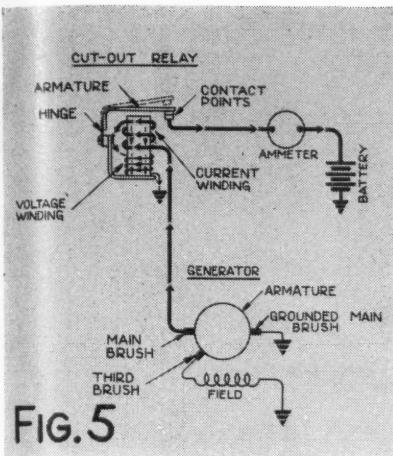


FIG. 5

A clear-cut explanation of underlying principles designed to make it easier for you to test and service generator, cut-out, brushes and commutator

By FRED SLOANE

GENERATOR SERVICE

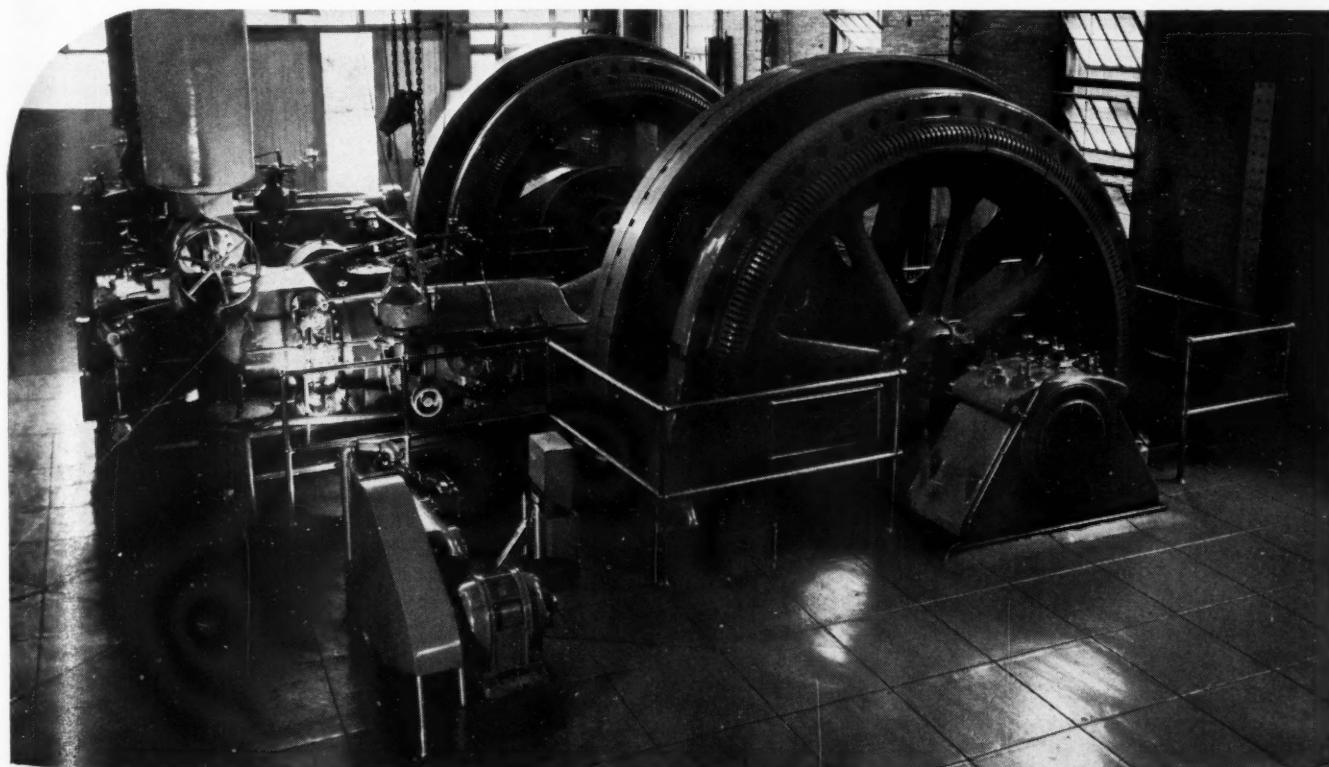
is a working field circuit. Here in this drawing I show the generator circuits and you'll note that the main insulated brush and the output lead are in dotted lines. (Fig. 1). All the insulated brush has to do is to pick up the current *after* it's been generated and carry it off

to the relay and then on to the battery.

"I've had hundreds of generators come in with the field coils burned bare of tape and the copper wire a dirty red. What does that tell you? It tells me a hell of a high current has been passing through the field

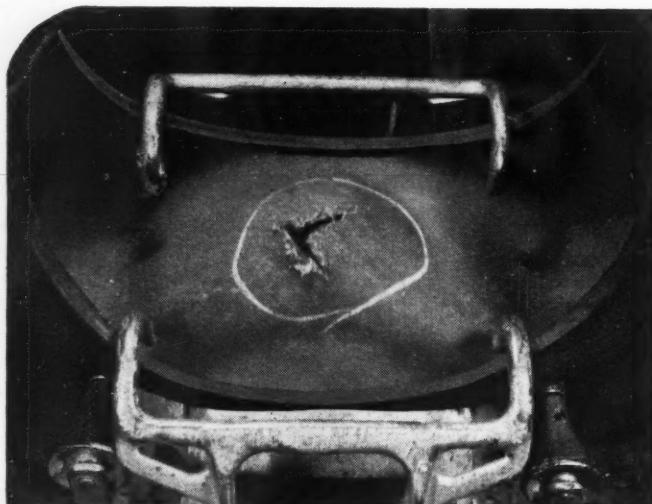
circuit, and the chances are that the entire output of the generator was being shunted through the fields because the collector brush wasn't on the job or the relay wasn't functioning.

"We always have a burned-up
(Continued on Page 90)



REPAIRING FABRIC BREAKS IN TIRES

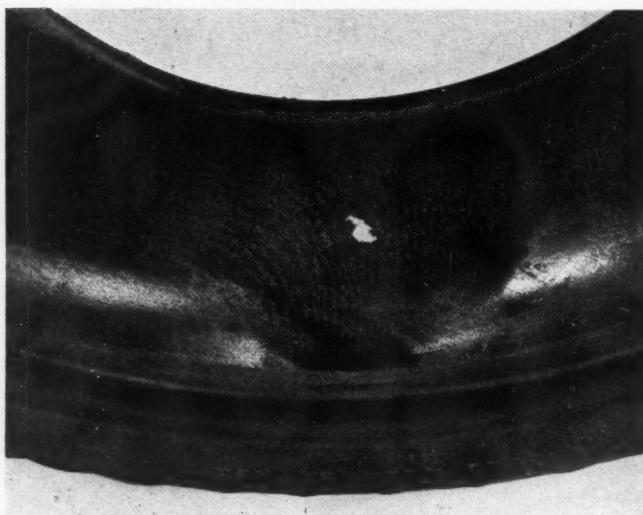
Tire fabric damage caused by glass, sharp stones and curb bruises can be repaired through vulcanizing by the factory-approved method shown here



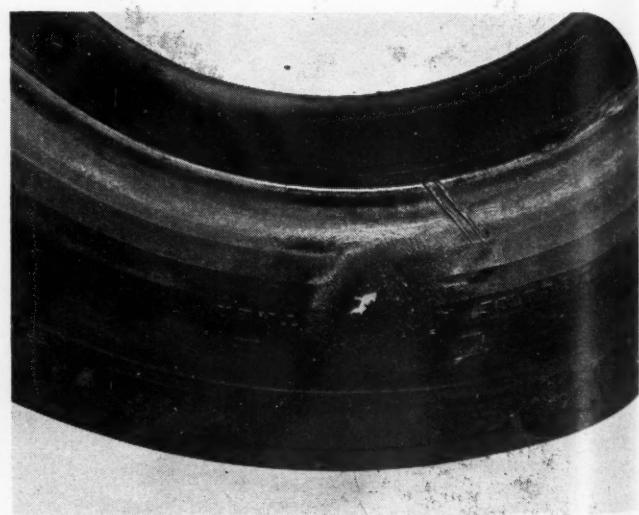
1 Spread the tire so that a thorough inspection can be made, not only of the break itself but of the area surrounding the break, and to check for breaks in the sidewall.



2 Cut away the edges of the break, back into the undamaged section of the tire, cutting on an angle of approximately 30 deg. Buff the area to clean the rubber from the cords.



3 Note the cords of the tire exposed after buffing. Apply a coating of rubber cement to the area to be repaired, and let it dry until tacky.



4 Apply the same procedure to the outside of the tire at the break. Cut away the edges on an angle of 45 deg. and apply a coating of rubber cement.



5 Apply as many layers of fabric patch as there are plies of the tire. Cords in first layer should run parallel to cords of tire, and each layer should be $\frac{1}{2}$ in. larger than preceding.



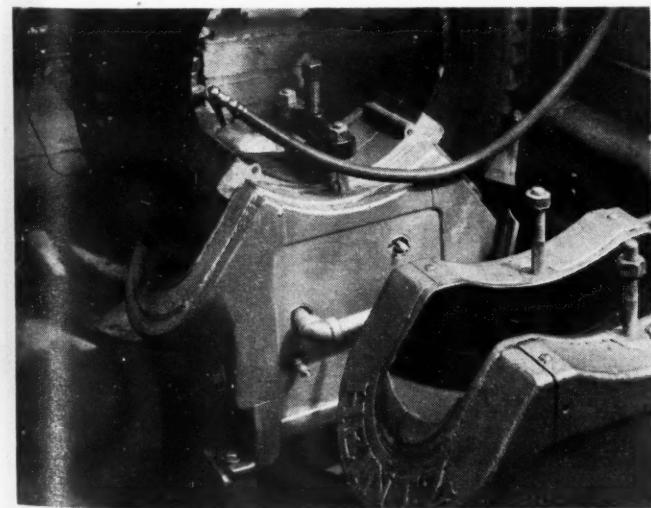
6 Fill the cavity to the level of the tread rubber with cushion gum rubber, pressing it firmly in place with a roller. This cushion gum forms a binder for the cords.



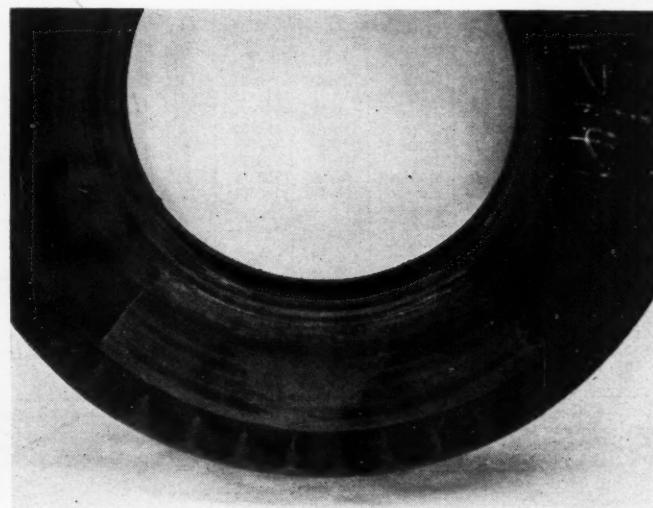
7 Cover the cushion gum with tread rubber, rolling it firmly in place, and entirely filling the cavity. Then trim it off level with the surrounding surface of the tire.



8 Insert the air bag into the tire in the area of the patch. Air bag is inflated to 70 lbs. pressure to withstand heat of the mold and the pressure applied during curing.



9 Install the tire in the sectional mold, and allow to cure from $1\frac{1}{2}$ to $2\frac{1}{2}$ hours, depending upon the number of plies of the tire. Patch is cured at temperature of 280 deg. F.



10 Completed job. Heat, pressure and time have combined to vulcanize the inside and outside patches together and to the tire, restoring its original strength.

SHOCK ABSORBER

FLUID CAPACITIES

CAR MAKE AND MODEL	Shock Absorber Make	Shock Absorber Model No. Front	Shock Absorber Model No. Rear	Amount of Fluid (Oz.) Front	Amount of Fluid (Oz.) Rear	CAR MAKE AND MODEL	Shock Absorber Make	Shock Absorber Model No. Front	Shock Absorber Model No. Rear	Amount of Fluid (Oz.) Front	Amount of Fluid (Oz.) Rear
BUICK 40-60-80-90 1938	Delco	1100S		10 1/2		HUDSON-TERRAPLANE 80-81-82 1938	Monroe	156577	156578	5	5
CHEVROLET Master-JB 1939	De'co	1116M		5 1/8		NASH 36-20, 38-80 1938	Delco	1187K	1189N	5 1/8	5 1/8
Master-KB 1940	Delco	1000N		5 1/2		38-20, 38-80 1938	Gabriel	B6001	B6501	+	+
CHRYSLER C14 1937	Monroe	665566	665899	3 3/4	5 1/2	39-20 1939	Delco	1112P	1117DD	5 1/8	8 1/8
C15 1937	Monroe	665567	665899	4 1/4	5 1/2	39-80 1939	Delco	1112M	1117DD	5 1/8	8 1/8
C16 1937	Monroe	665568	665899	3 3/4	5 1/2	39-20, 39-80 1939	Gabriel			+	+
C18 1938	Monroe	676739	682604	4	5 1/2	40-20, 40-80 1940	Delco		1006D		8 1/8
C19, C20 1938	Monroe	683091	682604	4	5 1/2	NASH LAFAYETTE 3810 1938	Delco	1187K	1189N	5 1/8	5 1/8
C22, C23 1939	Monroe	696240	696242	3 7/8	6 1/2	3810 1938	Gabriel	B6001	B6501	+	+
C22, C23 1939	Delco	1110C	1111T	3 3/4	6 1/2	3910-Special 1939	Delco	1112N	1117DD	5 1/2	8 1/8
C24 1939	Monroe	696241	696242	3 7/8	6 1/2	3910-De Luxe 1939	Delco	1112Q	1117DD	5 7/8	8 1/8
C24 1939	Delco	1134E	1130W	6 1/4	12	3910 1939	Gabriel			+	+
C25, C26 1940	Monroe	854568	854570	3 3/4	6 1/8	4010 1940	Delco		1006DD		8 1/8
C25, C26 1940	Delco	1000C	1001T	3 3/4	6 1/8	OVERLAND 39 (Early) 1939	Monroe	637509	637508	3 3/4	4 1/4
C27 1940	Delco	1134E	1130W	6 1/4	12	39 (Late) 1939	Monroe	637798	637799	4 1/4	5 1/2
C28, C30 1941	Delco	1000C	1001T	3 3/4	6 1/8	PACKARD 1800 1940	Monroe		11186		6 1/4
C33 1941	Delco	1134E	1130W	6 1/4	12	1801 1940	Delco		1001V		6 1/4
DE SOTO S3 1937	Delco	1162G	1163U	4 1/2	6 5/8	1803-1806 1940	Monroe		11187		6 1/4
S5 (Early) 1938	Delco	1162D	1163U	4	6 5/8	1900, 1903, 1906 1941	Monroe				6 1/4
S5 (Late) 1938	Delco	1177C	1178T	3 7/8	6 1/2	1901, 1904, 1905, 1907, 1908 1941	Delco		1021V		6 1/4
S6 1939	Delco	1110C	1111T	3 3/4	6 3/8	PLYMOUTH P3-P4 1937	Delco	1162U	1163U	6 5/8	6 5/8
S7 1940	Delco	1000C	1001T	3 3/4	6 3/8	P5-P6 (Early) 1938	Delco	1162U	1163U	6 5/8	6 5/8
S8 1941	Delco	1000C	1001T	3 3/4	6 3/8	P5-P6 (Late) 1938	Delco	1177T	1178T	6 1/2	6 1/2
DODGE D8 (Early) 1938	Delco	1162U	1163U	6 5/8	P7-P8 1939	Delco	1110C	1111T	3 3/4	6 3/8	
D8 (Late) 1938	Delco	1177T	1178T	6 1/2	P9-P10 1940	Delco	1000C	1001T	3 3/4	6 3/8	
D11 1939	Delco	1110C	1111T	3 3/4	P11, P12 1941	Delco	1000C	1001T	3 3/4	6 3/8	
D14, D17 1940	Delco	1000C	1001T	3 3/4	PONTIAC 26CA, 28CA 1937	Delco		1174U		6 5/8	
D19 1941	Delco	1000C	1001T	3 3/4	26DA-28DA 1938	Delco		1193U		6 5/8	
GRAHAM 72, 73, 75 1935	Spicer	J20	6A	*	25EA-26EB 1939	Delco		1116V		6 5/8	
74 1935	Spicer	F20	C10-5A	*	28EA 1939	Delco		1116V		6 5/8	
72, 73, 75 1935	Delco†	1150A1	1150A2	4 1/2	45-48	25-26-28 1940	Delco		1000V		6 5/8
74 1935	Delco†	1152A4	1150A5	4 1/2	45-48	24, 25, 26, 27, 28, 29 1941	Delco		1024V		6 5/8
80 1936	Delco	1152A14	1150A7	4 1/2	45-48	PONTIAC 26CA, 28CA 1937	Delco		1174U		6 5/8
90, 110 1936	Delco	1150A6	1150A13	4 1/2	45-48	26DA-28DA 1938	Delco		1193U		6 5/8
85 1937	Delco	1165L	1166K	5 1/4	5 1/8	25EA-26EB 1939	Delco		1116V		6 5/8
95, 116, 120 1937	Delco	1166K	1166K	5 1/8	28EA 1939	Delco		1116V		6 5/8	
96, 97 1938	Delco	1161K	1163P	5 1/8	25-26-28 1940	Delco		1000V		6 5/8	
96, 97 1939	Delco	1112J	1120N	4 1/2	5 1/2	24, 25, 26, 27, 28, 29 1941	Delco		1024V		6 5/8
107, 108 1940	Delco	1016M	1008N	4 1/2	5 1/2	REO 6A-6D 1935-36	Monroe	19535	19536	4	5
HUDSON LT, LTS 1934	Monroe*			4	5	4S-5S-7S 1934-35	Monroe	290	291	4	5 1/2
LL 1934	Monroe*			4	5 1/2	STUDEBAKER 5A 1937	Delco	1173L	1172U	5 1/4	6 5/8
LT, LTS 1934	Spicer	■	■	4 1/2	5	6A 1937	Delco	1171S	1172U	6 1/4	6 5/8
LL 1934	Spicer	■	■	4 1/2	3C 1937	Delco	1171S	1172X	6 1/4	7 1/4	
LT, LTS, LL 1934	Delco†	1153A10	1154B9	4 1/2	5 1/4	TERRAPLANE K-KU-KS 1934	Monroe	46730	46646	4	5
GH, HT, HU, HHU 1935	Spicer	J10	F14-3A	4 1/2	5 1/4	K-KU-KS 1934	Monroe†	46949	45950	4	5
GH, HT, HU, HHU 1935	Delco	1152A10	1151B9	4 1/2	5 1/4	G-GU 1935	Monroe	47258	47264	4	5
63, 64, 65, 66, 67, 1936	Delco	1152A6	1151C7	4 1/2	5 1/4	61-62 1936	Monroe	150421	150423	4	5
73, 74, 75, 76, 77, 1937	Delco	1175S	1174T	6 1/2	70-71-72 1937	Monroe	635702	635703	5	5	
83, 84, 85, 87 1938	Delco	1164S	1163T	6 1/4	WILLYS 37 1937	Monroe	152941	152942	3 3/4	4 1/4	
89 (112) 1938	Monroe	156778	156779	5	5 1/2	38 1938	Monroe	635702	635703	3 3/4	4 1/4
90 (112) 1939	Monroe	156778	156779	5	5 1/2	40 1940	Monroe	638316	638317	4 1/4	5 1/2
90 (Late) 1939	Monroe			6	6 1/2	WILLYS-AMERICAR 441 1941	Monroe			4 1/4	5 1/2
91 (Early) 1939	Monroe			5	5 1/2						
91 (Late) 1939	Monroe			6	6 1/2						
92 (Early) 1939	Monroe	157400	157401	5	5 1/2						
92 (Late) 1939	Monroe			6	6 1/2						
93-95-97 (Early) 1939	Delco			6 1/4	6 1/2						
93-95-97 (Late) 1939	Delco	1113R	1120S	6 1/8	6 1/4						
40-41-42-48 1940	Monroe	160101	160107	3 3/4	6 1/4						
43-45-47 1940	Delco	1007C	1008S	3 1/8	6 1/4						
12, 14, 17 1941	Delco	1007C	1008S	3 3/4	6 1/4						
10P, 10T, 11, 15 1941	Monroe			3 3/4	6 1/4						

†—Replaces original equipment for service.
‡—Monroe used on some cars.

§—Cannot be dismantled or refilled.

*—Remove shock absorber from car and fill through filler hole until fluid rises to top of bleeder hole.

■—Spicer Nos. D10-F10-H10-J10-K20.

▲—Spicer Nos. C11-C12-C13-E11-F12-H22-H23-3A.



"I'm gonna find out once and for all who's been borrowing my tools!"



SUPER SERVICE

IN BRONSON, MICH.

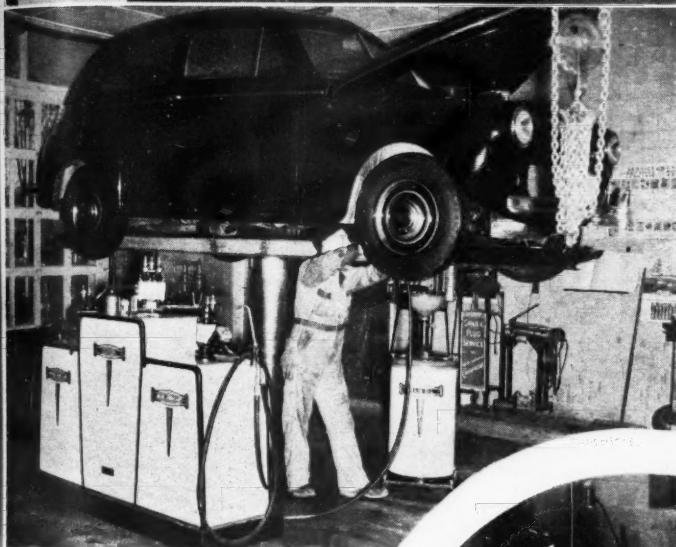


This shop scored a success because it was planned to provide the owner with every type of work his car might need

By A. E. HOLDEN

THE striking and successful super-service station of Bronson Motor Sales at Bronson, Mich., was built upon mistakes. Not those of Stephen Early, who operates the station, but of other and less successful shops.

Early used to sell automobiles and had the opportunity to study the operation of several shops from the inside. He saw them struggling against odds which, in his opinion, should never have been permitted



Modern equipment in use in the lubrication department of the Bronson Motor Sales, and, top, repacking wheel bearings. Left above, attractive exterior of the shop. Right, buffing fender in the body department.



to exist. He saw them loaded down with excessive overhead, fettered by obsolete or inadequate equipment, and often defeated by failure to take full advantage of their opportunities. It seemed to him that a well-organized and intelligently operated service station was bound to make money, and a little more than a year ago he opened his own. In planning it, Early sought to avoid every mistake he had noted in other operations.

The result was a shop that offered complete service. Early's plan for conducting the business was summed up in a five-point plan:

1. Diversification of service and merchandise.
2. Attractiveness, inside and outside.
3. Accessibility.
4. Well-displayed merchandise.
5. Constructive selling.

Diversification of service meant

merely that Early had to offer virtually everything in the way of repairs and service the customer was likely to need. Besides gasoline and oil, the station offers lubrication service, tune-up and major repairs, washing, painting, and body work. The line of merchandise carried—tires, batteries, accessories, supplies, parts—is complete enough to meet every ordinary owner need.

In attractiveness, the station has few superiors. It is modern in construction, well-lighted, and is always kept as neat and clean as constant effort can make it.

Accessibility is just another way of saying the station is so designed as to make it easy for customers to buy service. At the Bronson station, it is ridiculously easy to get in and out. The gasoline pumps are located on an island in front, and each of the three major departments—lubrication, repair, and body—open upon the wide apron next to the street.

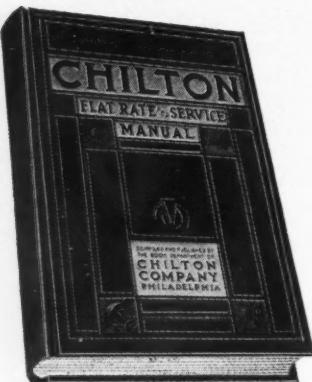
Early goes to unusual lengths to display his merchandise. In summer, he maintains an outdoor display of tires and batteries. The wide windows at the office end of the building are filled with frequently changed displays of accessories, equipment and supplies. Along one wall inside is a permanent display of tires, batteries, accessories and packaged lubricating oil. Early insists that prominent display makes these numerous items sell themselves.

Constructive selling, as Early uses the term, is a type of merchandising above plain selling but not quite so ambitious as high-pressure and overselling. It means keeping constantly on the alert for defects in customers' cars that ought to be remedied. Early's men do not try to overpower the customer. They merely call his attention to the trouble and suggest that now is the time to have it fixed, before it develops into a serious and expensive repair job.

"Recently a tourist drove in for gasoline," said Early. "We made 20 cents gross on the sale. But the man at the pump noticed that the owner needed a new fan belt. The owner bought one and actually thanked the man for calling it to his attention. We made 65 cents gross on the belt. That's what I mean by constructive selling. Too many shops overlook it."

"In the case of body service, the opportunity is unlimited. About 95 per cent of the cars that drive in need something or other done to the fenders. Just a suggestion to

(Continued on Page 76)

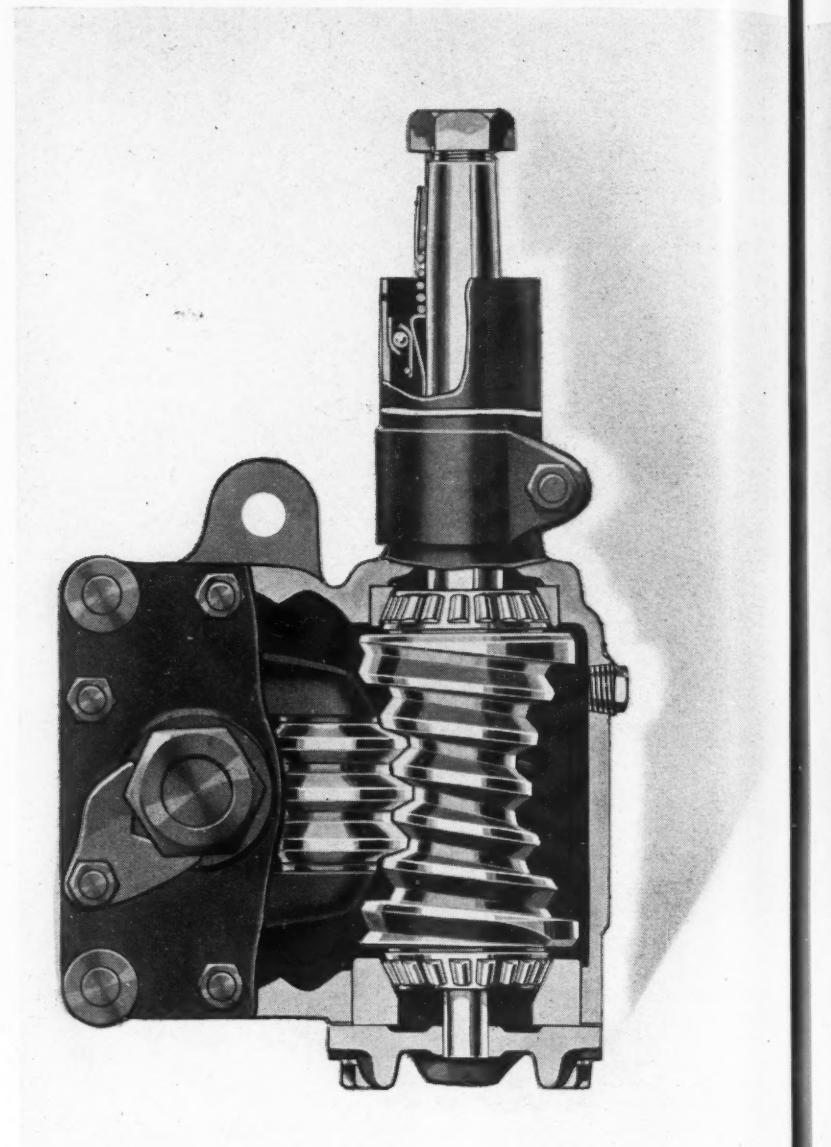


The mechanical procedure in this and other articles in Motor Age supplements the Service Section of the Chilton Flat Rate and Service Manual, the book used by 26,000 maintenance shops.

THE worm shaft adjustment as well as the cross shaft adjustment of the new Gemmer model "400" or "500" steering gear is made by shims. This gear differs from previous models in that the shims for the roller shaft adjustment can be removed without removing the roller shaft end plate, and the fact that there is no adjusting screw to take care of roller shaft end play. Also, the three-tooth roller operates on needle bearings instead of ball bearings.

The first step in the adjustment of this gear is to eliminate the up-and-down play of the worm shaft. First, check to determine if an adjustment is necessary, by turning the steering wheel one turn to the right from a straight-ahead position. Tie one spoke to the left door post and hold the steering wheel tightly against this tie-rope so as to prevent the wheel from turning. Grip the steering column with the other hand, resting one finger against the bottom of the steering wheel hub. Then have a helper shake the front wheels violently. Any end play in the steering tube will be felt by the finger resting on the steering wheel hub.

If an adjustment is necessary, loosen the four worm cover screws and remove the cover. Use a knife to peel off the top shim, and reinstall the cover. Remove only



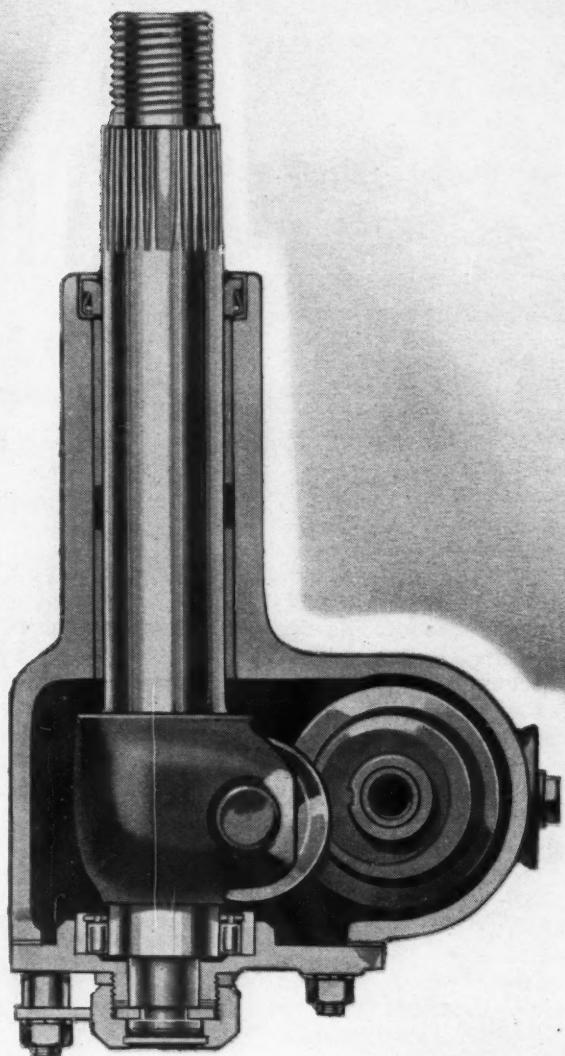
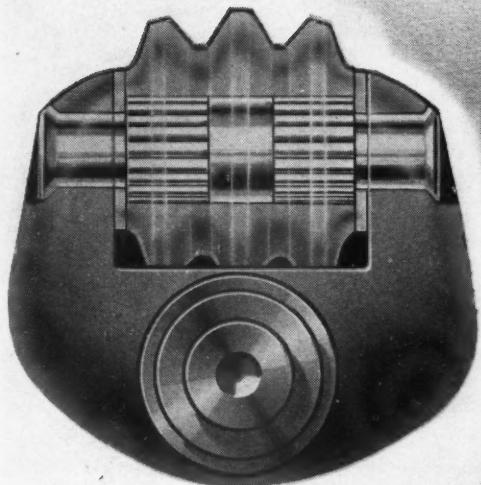
FLAT RATING

Instructions and illustrations to

one shim at a time until proper adjustment is obtained; just enough to remove the end play and not cause stiffness.

Remove the drag link from the pitman arm and turn the steering wheel from extreme right to ex-

treme left to be sure it is free. Loosen the frame bracket bolts to allow the gear to align itself with the instrument panel bracket. Tighten the bracket bolts, and then loosen the instrument panel bracket to permit it to adjust it-



STEERING GEAR ADJUSTMENT

help speed your work on latest type Gemmer models 400 and 500

self and then tighten the bracket.

With the drag link removed, place the steering gear in its mid-position. Grasp the pitman arm and shake it. If any lost motion is present it will be necessary to adjust the roller shaft. Remove

the nut holding the lock plate for the adjusting nut, and remove the lock plate. Remove the lock nut and the "C" type thrust washer. Remove one or more shims from the end of the roller shaft—just enough to remove all end play.

Reinstall the lock nut, lock plate and plate retaining nut. The lock plate is designed to provide four different locking positions by reversing the plate if necessary to obtain the position in which it will hold the lock nut.

PREPARING FOR



NATIONAL DEFENSE

By BOB HANKINSON

IN previous stories of this series of National Defense articles designed to acquaint the automobile mechanic with the various types of aircraft engines, we have described the Wright and Pratt & Whitney air-cooled radials and the Allison V-12 liquid-cooled engine. This article deals with the Ranger engine made by the Ranger Aircraft Engines Division of Fairchild Engine & Airplane Corp., Farmingdale, Long Island, N. Y.

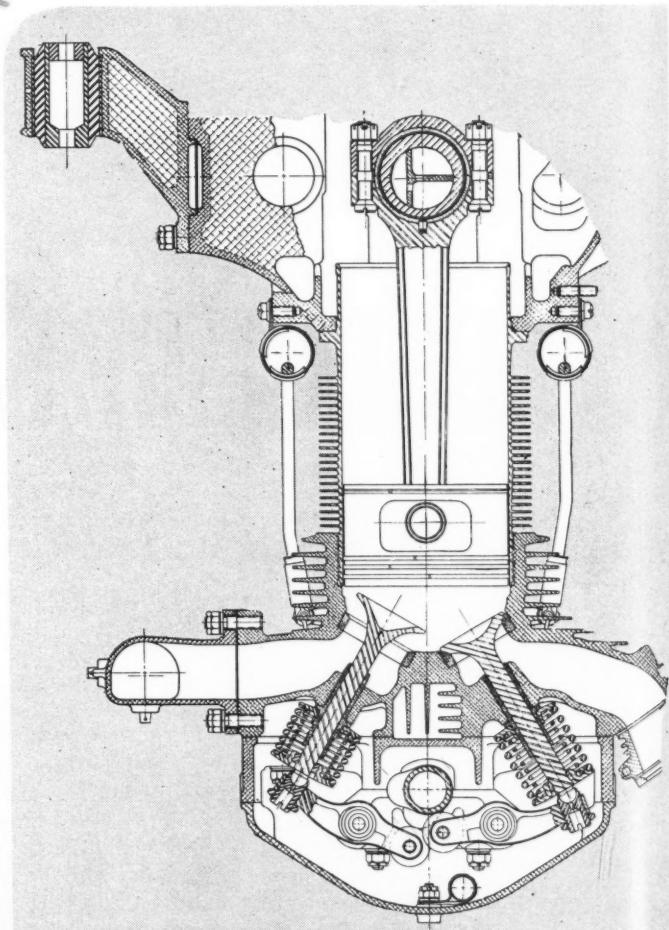
This is a 6-cylinder-in-line, air-cooled engine, inverted type. In other words, this engine operates upside down when compared with the normal automobile engine. What would normally correspond to the crankcase and oil pan is on top when this engine is mounted in the airplane, and the cylinder heads, with the "overhead" cam-shaft, are on the bottom.

The first thought that comes to mind when considering the position in which this engine is mounted is, "Where does the oil go?" The answer, of course, is that this is a dry-sump engine—in other words, it does not carry a supply of oil in itself, as the automobile engine does. The lubricating oil is pumped from the oil tank to the vital parts of the engine by a pressure pump, and is returned to the oil tank by a scavenger pump. The pressure

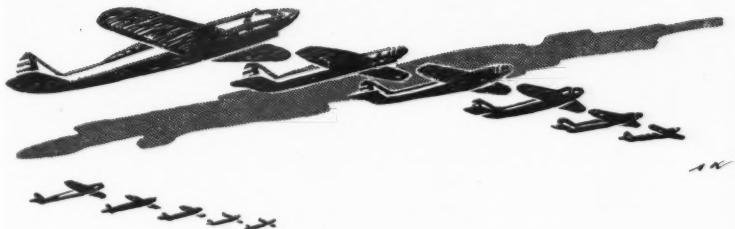
pump operates in the front of the main crankcase on the top of the engine, and the scavenger pump operates from the rear of the cam-shaft in the bottom of the engine.

There are two principal reasons for using an inverted type engine

in an airplane. First is the improved visibility this type of mounting makes possible. The cylinders are down out of the way, giving a clear view from the pilot's cockpit straight out over the nose of the ship. The second is that it



Right, sectional view of the Ranger 6-cylinder air cooled inverted engine, showing cylinder construction and valve mechanism. Opposite page, three-quarter left front view of the same engine, showing intake manifold and carburetor.



Another of the articles designed to keep mechanics up-to-date on engines being used by our armed forces. This month details are given on the Ranger

permits mounting the crankshaft and propeller in line with the center line of the ship. For obvious reasons, the crankshaft, with its propeller, should exert its pulling force through the fore-and-aft center of the plane in a single-

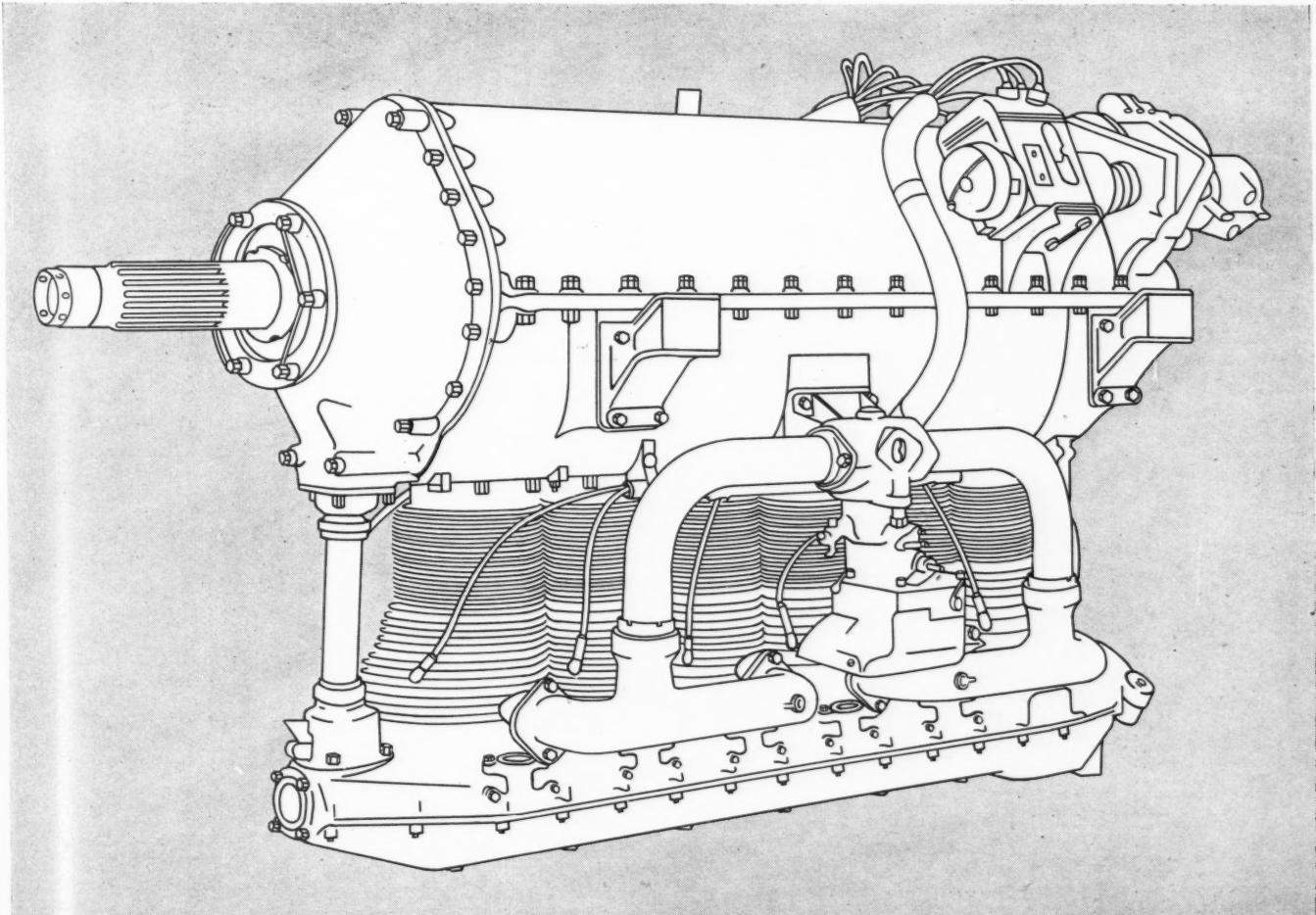
engine job. In order to do this, the conventional engine would have to be mounted so high that the pilot's vision would be obstructed. By turning the engine upside down, it is possible to obtain this desirable position for the crankshaft and at

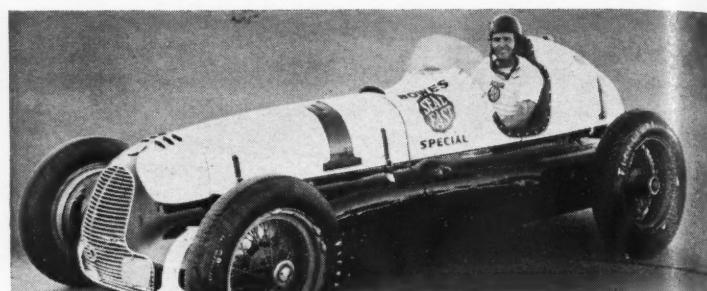
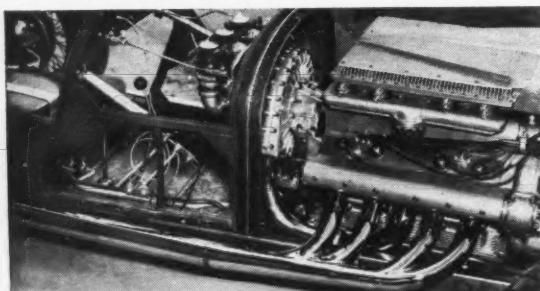
the same time provide a clear view for the pilot.

The Ranger engine illustrated is a Model 6-440C, made in four models. The cylinders are $4\frac{1}{8}$ x $5\frac{1}{2}$ in., having a total displacement of 441.0 cu. in. Compression ratios are 6, 6.2, 6.8 and 7.5 to 1, and develop 175, 180, 190 and 200 hp., respectively. Cylinders are numbered from the back toward the front, the front cylinder being No. 6.

The practice of using two spark plugs per cylinder, and two magneto's, common to most aviation engines, is followed in the case of the Ranger. Ignition timing occurs 35 deg. before top center, and intake valves are lashed at 0.015 in. clearance, and exhaust valves at 0.030 in.

An overhead camshaft is used, with valve rocker arms bearing directly on the cams, eliminating the use of push rods. Valve clearances are adjusted by means of a screw-type ball stud in the end of the rocker arm, bearing on the end of the valve stem.





Hepburn's V-8 engine is shown at left. May's car is at right.

Indianapolis Entrants

Car No.	Name	Driver	Engine Make	No. Cylinders	Bore	Stroke	Displacement	Supercharger	Spark Plug	Ignition	Carburetor	Suspension	Shock Absorbers	Fuel	Oil	Weight	Qualifying Time												
1	Bowes Seal Fast Spl.	Rex Mays	B	8	2.968	3.250	179.6	Y	C	S	B	PC	W	2	DD	Cv	H	R	AI	52	RF 40	2060	128.301						
2	Boyle Spl.	Wilbur Shaw	Mas	8	2.677	3.937	177.2	Y	C	S	B	PC	Me	2	H	Ind	Cv	H	F	F	R	AI	48	O 44	1936	127.836			
3	Elgin Piston Pin Spl.	Mauri Rose	Mas	8	2.677	3.937	177.2	Y	C	S	B	PC	Me	2	H	Ind	Cv	H	F	F	R	AI	52	O 52	2000	128.691			
4	T. E. C. S. Spl.	Ted Horn	S	6	3.203	3.750	181.0	Y	C	S	B	PC	W	1	H	Cv	H	H	H	H	R	AI	60	O 32	1980	124.297			
5	Thorne Engineering Spl.	Joe Thorne	S	6	3.530	4.625	272.0	N	C	B	B	PC	W	6	DD	Cv	Cv	H	F	F	R	AI	50	O 40	1966	121.163			
6	Bill Holabird Spl.	Frank Wearne	O	4	4.250	4.500	255.0	N	C	B	B	PC	W	2	UD	Cv	Cv	H	H	F	R	AI	26	G 32	1820	123.890			
7	Zollner Piston Spl.	Frank Brisko	Br	6	3.625	4.375	271.0	N	C	B	B	PC	W	3	UD	Cv	Cv	M	D	H	F	G	30	G 42	1979	123.381			
8	Fageol Spl.	Mel Hansen	O	4	4.312	4.625	270.0	N	C	B	B	PC	W	2	UD	Ind	Ind	M	B	Fa	H	F	G	40	G 36	2010	124.559		
9	Gilmores Red Lion Spl.	Geo. Robson	M	4	3.812	4.000	182.8	Y	C	S	B	PC	M	2	DD	Cv	Cv	H	H	H	H	4W	G	53	O 32	1874	121.576		
10	Miller Spl.	Al Miller	M	6	3.500	3.125	180.4	Y	C	S	B	PC	M	2	DD	Ind	Ind	H	H	H	H	HH	4W	G	40	G 36	2225	123.478	
11	Boyle Spl.	Geo. Connors	O	4	4.265	4.500	257.0	N	C	B	B	PC	W	2	UD	Cv	Cv	H	H	H	R	G	31	O 34	1790	123.984			
12	Ziffirin Spl.	Harry McQuinn	AR	8	3.010	3.200	182.6	Y	C	S	B	PC	W	2	UD	Cv	Cv	H	H	F	R	R	AI	55	RF 30	1970	125.448		
13	Noc-Out Hose Clamp Spl.	Floyd Davis	O	4	4.312	4.625	270.0	N	C	S	B	PC	W	2	UD	Cv	Cv	H	H	F	R	R	AI	31	O 40	1991	121.106		
14	Elgin Piston Pin Spl.	Duke Nalon	Mas	8	2.716	3.937	180.0	N	C	S	B	PC	W	2	H	Ind	Cv	H	H	F	R	AI	48	O 32	1982	122.237			
15	Kennedy Tank Spl.	Emil Andres	L	6	3.750	4.000	265.0	N	C	B	B	PC	W	4	3	DD	Ind	Cv	H	H	H	R	AI	44	TA 40	1958	122.266		
16	Talbot Spl.	Rene Le Begue	T	6	4.681	4.347	274.3	N	C	B	B	PC	W	3	DD	Ind	Cv	H	H	B	R	AI	80	*115.03	1980	124.417			
17	Airliner S. S. Spl.	Kelly Petillo	O	4	4.312	4.625	270.0	N	C	B	B	PC	W	2	UD	Cv	Cv	H	H	H	R	G	40	G 32	1890	124.417			
18	Hollywood Pay Day Spl.	Billy DeVore	O	4	4.333	4.625	272.0	N	C	B	B	PC	W	2	UD	Cv	Cv	H	H	H	R	G	30	G 24	1924	121.770			
19	Talbot Spl.	Jean Trevaux	T	6	4.681	4.347	274.3	N	C	B	B	PC	W	3	DD	Ind	Cv	H	H	H	R	R	AI	80	1980	124.417			
20	Blue Crown Spark Plug Spl.	Joie Chitwood	O	4	4.290	4.500	258.0	N	C	B	B	PC	W	2	UD	Cv	Cv	M	B	H	H	A	AI	28 1/2	TA 32	1838	120.329		
21	Phillips Spl.	Overton Phillips	M	V-8	3.500	3.500	269.0	N	C	B	B	PC	W	4	DD	Cv	Cv	H	H	F	F	R	G	28	G 40	1993	116.298		
22	Tom Joyce 7-Up Spl.	Sam Hanks	O	4	4.312	4.625	270.0	N	C	B	B	PC	W	2	UD	Ind	Cv	H	H	H	R	G	40	G 24	1990	118.211			
23	Mark Spl.	T. Hinnerhitz	O	4	4.312	4.625	270.0	N	C	B	B	PC	W	2	UD	Cv	Cv	H	H	H	R	G	27 1/2	O 30	1955	121.021			
24	Sampson Spl.	Shorty Cantillon	Sa	16	2.187	3.000	183.0	Y	C	S	B	PAH	W	2	DD	Cv	Cv	C	TB	H	H	F	R	AI	50	O 40	2168	124.440	
25	Noc-Out Hose Clamp Spl.	Cliff Bergere	O	4	4.327	4.625	270.0	N	C	B	B	PC	W	2	UD	Cv	Cv	H	H	F	R	Spl	58	RF 40	1940	123.890			
26	Miller Spl.	Geo. Barringer	M	6	3.500	3.125	180.4	Y	C	S	B	PC	W	2	DD	Cv	Cv	H	H	H	H	HH	4W	G	41	G 36	2228	122.299	
27	Indiana Fur Spl.	Doc Williams	O	4	4.250	4.500	255.0	N	C	B	B	PC	W	2	UD	Cv	Cv	M	D	Ha	H	F	R	G	30	G 32	1867	124.014	
28	Greenfield S&S Spl.			8			272.0																						
29	Kimmel Spl.	Kimmel	K	12	2.750	3.750	269.0	N	C	B	B	PC	Z	4	DD	Cv	Cv	H	B	H	H	R	R	32	24	2006	121.540		
30	Boyle Spl.	Chet Miller	M	8	3.375	3.750	268.0	N	C	B	B	PC	M	4	DD	Cv	Cv	M	D	H	F	R	G	37	O 28	2006	121.540		
31	Sportsman's Club Spl.	R. Snowberger	M	4	4.250	4.500	255.0	N	C	B	B	PC	W	2	UD	Cv	Cv	M	D	H	F	R	G	50	RF 36	1915	120.104		
32	Greene Spl.	G. Greene	G	4	4.000	4.500	226.2	N	C	B	B	PC	W	2	UD	Cv	Cv	H	D	F	F	R	G	46	G 48	1914	*116.152		
33	J & S Spl.	L. Durant	Mer	8	3.187	3.750	239.0	N	C	B	B	PC	S	2	DD	Ind	Ind	H	F	F	F	R	G	15	G 24	1914	*116.152		
34	Leader Card Spl.	Paul Russo	M	8	2.480	3.500	135.0	N	C	B	B	PC	M	2	DD	Cv	Cv	M	B	H	H	R	G	35	C 36	1780	125.217		
35	Mark Bowles Spl.	Everett Saylor	O	4	4.250	4.500	255.0	N	C	B	B	PC	W	2	UD	Cv	Cv	M	B	H	H	R	G	43	G 26	1812	119.880		
36	H-3 Spl.	Roy Russing	O	4	4.250	4.500	255.0	N	C	B	B	PC	W	2	UD	Cv	Cv	H	H	F	F	R	G	34	G 40	1920	121.074		
37	Bowes Seal Fast Spl.	Ralph Hepburn	W	V-8	3.125	2.937	180.0	Y	B	S	B	PC	W	3	DD	Cv	Cv	C	H	B	H	R	G	51	RF 48	2099	120.686		
38	Schoof Spl.	Al Putnam	O	4	4.250	4.500	255.0	N	C	B	B	PC	W	2	UD	Cv	Cv	C	H	B	H	R	G	34	O 30	1830	121.951		
39	Tony Willman	Tony Willman	O	4	4.275	4.625	261.0	N	C	B	B	PC	W	2	UD	Cv	Cv	H	D	F	F	R	AI	34	O 30	1830	123.920		

ABBREVIATIONS:
Engine Make
 B—Bowes
 Mas—Maserati
 S—Sparks
 O—Offenhauser
 Br—Brisko
 M—Miller
 AR—Alfa-Romeo
 L—Lenzi
 T—Talbot
 Sa—Sampson
 K—Kimmel
 G—Greene
 * Out of race—too slow.

Mer—Mercury
Winfield
Supercharger
 Y—Yes
 N—No
Cable
 P—Packard
Spark Plugs
 B—Bowes
 C—Champion
 BC—Blue Crown
Piston Ring
 PC—Perfect Circle
 B—Burd
 AH—American Hammered
Carburetor
 W—Winfield
 B—Bosch
Ignition
 B—Bosch
Brakes
 H—Hydraulic
 Z—Zenith
 S—Stromberg
Starter
 H—Hand
Shock Absorbers
 H—Houdaille (Houde)
 F—Friction type
 Ind—Independent
 TB—Torsion Bar
Suspension
 Cv—Conventional
 Ind—Independent
 Me—Memini
Drive
 R—Rear
 F—Front
 4W—Four Wheel
Fuel
 AI—Alcohol
 G—Gulf
 Ph—Phillips
Oil
 RF—McMillan Ring Free
 O—Oilzum
 G—Gulf
 TA—Thompson-Aerotype

* Running at finish

How They Finished

Finish Position	Driver	Number of Car	Car Name	M.P.H.	Cause of Withdrawal	Number of Pit Stops	Withdrawn In Lap No.	Finish Position	Driver	Number of Car	Car Name	M.P.H.	Cause of Withdrawal	Number of Pit Stops	Withdrawn In Lap No.
1	Rose-Davis	16	Noc-Out Hose Clamp	115.117		1		2	Thorne	1	Elgin Piston Pin		Plugs fouled	3	61
2	Mays	1	Bowes Seal Fast	114.459		3		3	Thorne	1	Elgin Piston Pin		Wrecked	1	5
3	Horn	4	Elgin Piston Pin	113.824		1		4	Zollner Piston	2	Elgin Piston Pin		Valve Troubles	1	71
4	Hepburn	54	Bowes Seal Fast	113.573		2		5	Fageol Special	2	Zollner Piston		Broken conn. rod	2	12
5	Bergere	34	Noc-Out Hose Clamp	113.528		0		6	Robson	10	Gilmores Red Lion		Oil leak	1	47
6	Chet Miller	41	Boyle Special	111.921		1		7	Al Miller	12	Miller Special		Trans. failure	4	22
7	Ziffirin Special	15	Boyle Special	111.795		3		8	Connors	14	Boyle Special		Trans. failure	2	167
8	Wearne	7	Bill Holabird	110.777		1		9	Andres	19	Kennedy Tank		Wrecked	1	47
9	Russo-Durant	45	Leader Card	105.628		3		10	Petillo	22	Airliner S. S. Special		Broken conn. rod	1	47
10	Robson-Hinnerhitz	29	Marks Special	105.152		3	*	11	De Vore	22	Airliner S. S. Special		Broken conn. rod	1	47
11	Tomei	53	H-3 Special			4	*	12	Deacon Litz	33	Sampson Special		Broken oil line	3	89
12	Durant-Putnam	55	Schoof Special			3	*	13	Williams	36	Sampson Special		Oil pump failure	2	89
13	Hansen-Phillips	26	Phillips Special			4	*	14	Snowberger	42	Sportsman's Club		Water leak	2	108
14	Chitwood	25	Blue Crown Spark Plug			3	*	15	Wiliam	47	Mark Bowles Special		Water leak	2	156
15	Nalon	17	Elgin Piston Pin			8		16	Lyons	62	Lyons Special		Wrecked	1	118
17	Shaw	2	Boyle Special			3	151					</			

WHAT'S WRONG WITH THIS SHOP?

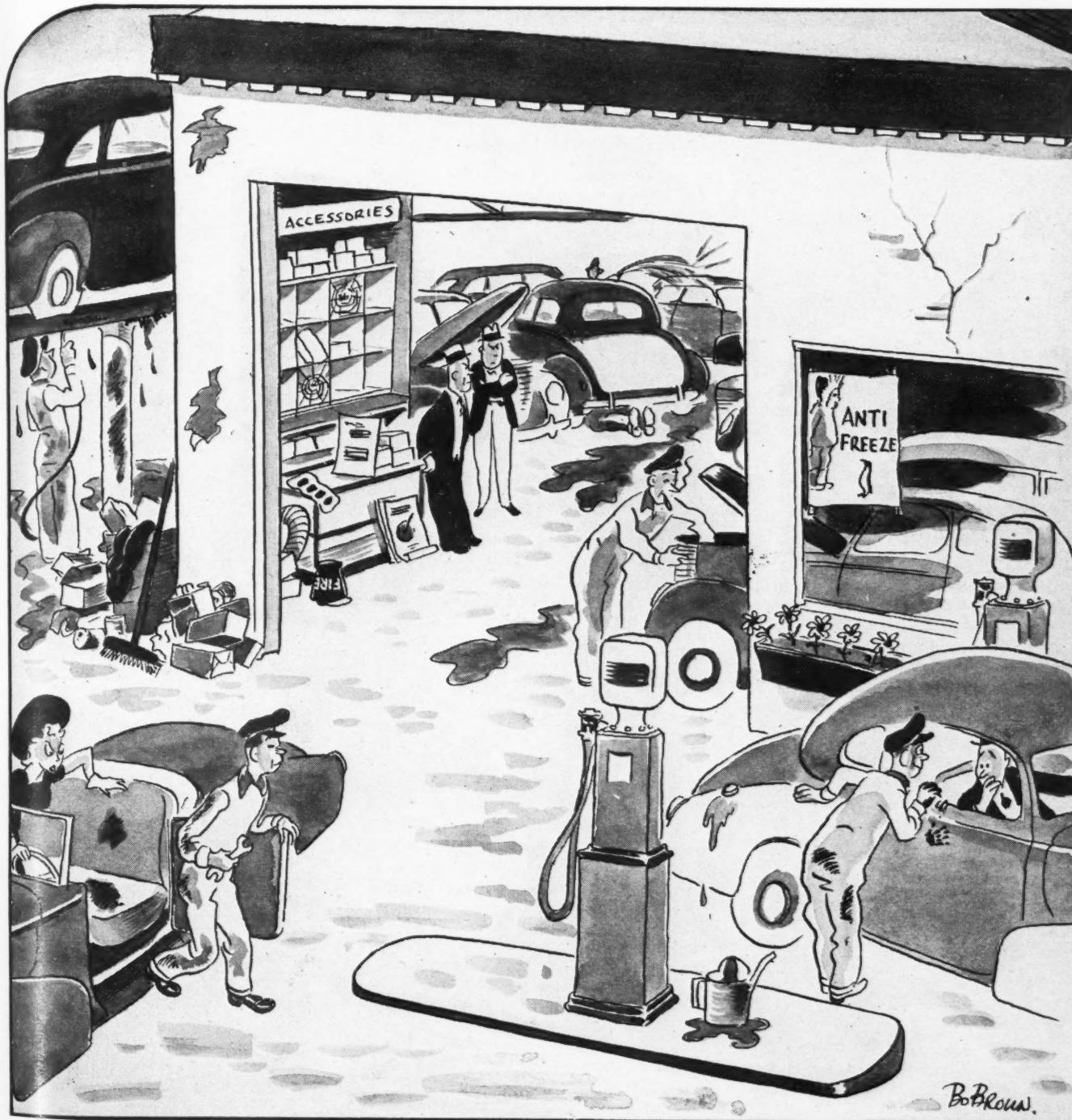
ASKS ROSE LU GOLDMAN

THE other day we asked a new staff artist to make us a drawing of a service station. The next day he laid this on our desk.

Upon making careful inspection of the drawing, we found exactly 15 things wrong with the picture—15 errors of omission and commission which no real service manager would allow to exist in his shop.

Can you find the 15 points to which we refer?

(Answers appear on page 135)



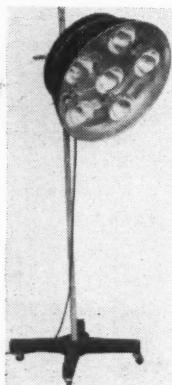
Bob Brown.

NEW profit makers

PARTS

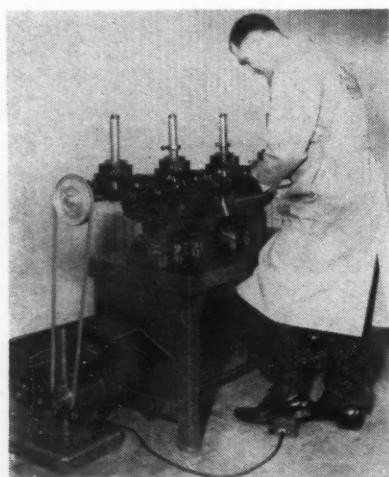
Lamp Speeds Paint Drying

A new infra-red drying unit, developed by the Arco Co., 7301 Bessemer Ave., Cleveland, Ohio, is being offered as a means of speeding up the time required for drying synthetic enamel when used for spotting in on body repairs. The manufacturer states that this drying unit will reduce the drying time from all day to a matter of 8 or 10 minutes. The unit uses six bulbs of the sealed-beam type, with frosted lenses to give uniform heat without dead spots.



Power Drive For Boring Machine

Cedar Rapids Engineering Co., 902 17th Street, N.E., Cedar Rapids, Iowa, has developed a power drive unit for use in connection with the Kwik-Way bearing line boring machine. The outstanding advantage of this drive is that the operator can stand over the work and watch what he is doing,



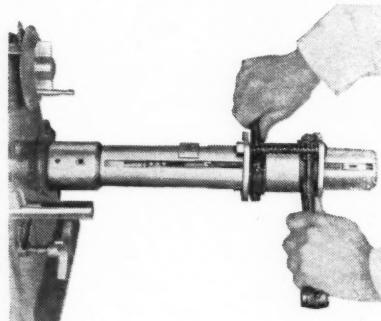
TOOLS

EQUIPMENT

controlling the operation of the line borer with his foot. The base of the power drive is equipped with a vertical post so that the unit may be quickly raised or lowered to accommodate the various heights of the boring bar when used in different make motors.

Rod Grinding Fixture

An improved rod-grinding fixture for grinding rod bushings from V-8 Ford engines has been announced by Sunnen Products Co., 7910 Manchester Avenue, St. Louis, Mo. It is designed to operate in the Sunnen bushing grinder. Clamps and fixtures are furnished so the rods can be clamped together and ground in pairs. An im-



portant feature is the specially designed mandrel, which uses two stones and two non-cutting guides. Roughing and finishing stones are furnished for fast cutting and good finish.

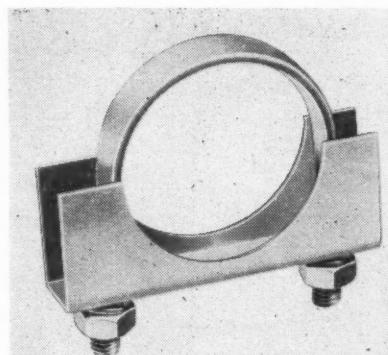
Valvoline "HPO"

A new lubricating oil for Diesels and high-power output gasoline engines has been developed by Valvoline Oil Co., 5th & Butler Streets, Cincinnati, Ohio, under the name "Valvoline HPO." This heavy-duty motor oil is said to lubricate perfectly at extreme heats and prevents the formation of "varnish" throughout the engine. It has been engineered specifically to avoid bearing failures, ring sticking, sludging, burned valves and failure of other parts. Having a high viscosity index, this new "HPO" oil is said to result in lower oil consumption.

ACCESSORIES

Muffler Clamp

A new style clamp for holding the tail pipe to the muffler has been announced by Aluminum Industries, Inc., 2416 Beekman Street, Cincinnati, Ohio, makers of Permite products. This new clamp, illustrated, assures an air-tight connection, and



a wide circular contact surface provides equalized pressure so that the tail pipe will not be pinched out of shape. Holds securely against vibration and road shock. Permite muffler clamps are being offered in an attractive display box containing 36 clamps six each of six different sizes.

Batteries Carry Distinctive Marking

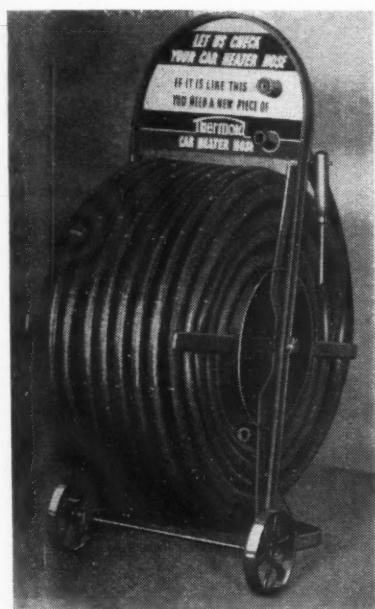
As an aid to selling the right battery for the job, the Gould Storage Battery Corp., Depew, N. Y., has in-



roduced a line of batteries which carry the words "Equipment Size," "Heavy Duty—All Rubber Separators," and "Scout" molded into the case. This distinctive marking will enable the owner to compare the batteries available, and it is believed that he will elect at least the "Equipment Size" when buying, since this is the same size as the original equipment used in his car. The "Scout" line covers the competitive types. A new promotional plan designed to aid dealers in battery sales will shortly be announced by the company.

Heater Hose Displayed on Reel

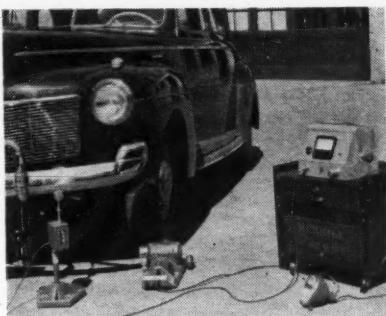
A new and different dispensing and display unit for car heater hose has been announced by Thermoid Co., Trenton, N. J. It resembles a garden hose reel, and is furnished free to dealers with a purchase of 250 ft. of 19/32 in. universal size two-braid



Thermoid car heater hose. The merchandiser is mounted on wheels so that it can be moved outside to make an attractive display, or it can be moved over to the car and the required length of hose cut off.

Balances Wheels On The Car

A new type of wheel balancer, known as the Merrill Electronic Wheel Balance, has been introduced by the Merrill Engineering Laboratories, 1230 Lincoln Street, Denver, Colo. The outstanding feature of this instrument is that it will balance either front or rear wheels on the car under actual running conditions. The car is jacked up and a sensitive mechanism is placed against the bumper. An electric motor spins the wheel, and the mechanism measures the vibration as produced by the out-of-



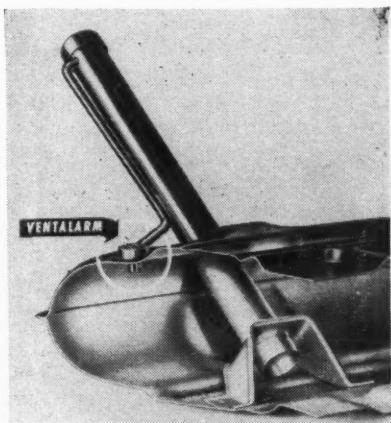
balance condition and records it on the dial of another instrument, indicating the amount of weight needed to offset the vibration. The flashing light picks out the point of greatest out-of-balance, thereby indicating the location of the balance weight.

Increased Capacity Steam Cleaners

Two new super-capacity Hypersure Jenny steam cleaners Models J-L and J-M have just been announced by Homestead Valve Mfg. Co., Coraopolis, Pa. These new models are said to be more powerful than previous models, which means faster and more thorough cleaning of automotive parts, chassis, motors, machinery, floors, walls, exteriors of buildings, etc. A new simplified automatic compound feed, greater portability through the elimination of all dead weight, and greater simplicity of construction and operation are among the many new features included, according to the manufacturer.

Signals Full Tank

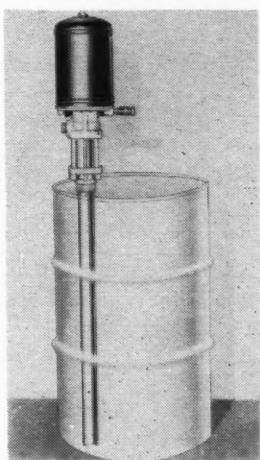
A device that gives a warning when the gas tank is within 1 gal. of being full has been placed on the market by the Scully Signal Co., 88 First Street, Cambridge, Mass. This device is standard equipment on the new Packard Clipper. Known as "Ventalarm," this device is installed on top of the gas tank in series with the vent. As gasoline is poured into the tank, the escaping air passes through the Ventalarm, causing a whistle in the



filler neck. When the tank is within 1 gal. of being full, the whistle stops. Overfilling is prevented, and sufficient space is left in the tank to allow for expansion of the gasoline on hot days.

Lubrication Pumps

A new series of barrel pumps for heavy-duty lubrication use has been announced by the Alemite Division of Stewart-Warner Corp., Diversey Parkway, Chicago, Ill. Ranging from the smaller model for 100-lb. drums up to the heavy duty model for the 400-lb. drum and for dispensing semi-solid lubricant, these pumps are adapt for every shop from the small repairman to the fleet garage and motor bus maintenance shops. All pump castings are of fine grain cast iron of high tensile strength, and the wearing surface of the cylinder is hard chrome-plated over cast iron.



Emergency Ignition Coil

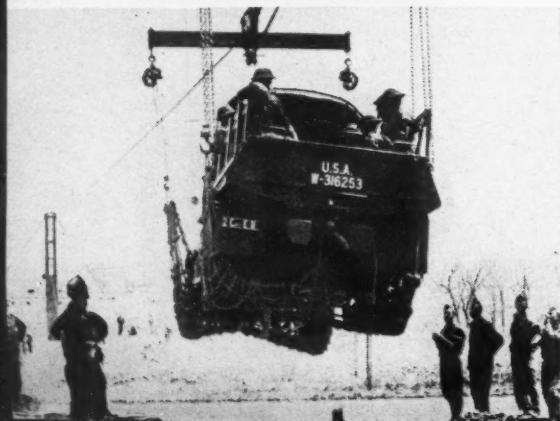
Stan-Test Corp., Morgan & Quincy Streets, Chicago, Ill., announces that it has taken over the manufacture and sale of the well-known Genuine K-W emergency ignition coil. This product is being manufactured with several new features, including a non-breakable case with polished nickel-plated steel ends, detachable cables easily replaced when worn or damaged, and other improvements.

The genuine K-W S.O.S. emergency ignition coil is for use in driving a car any distance when troubles occur, such as coil burn-out, cylinder breakdown, defective or unsynchronized contact points, lost switch key, cold or wet motor, or any other ignition trouble. The S.O.S. coil will operate the motor, it is said, even though all these troubles were to occur at one time. It is a complete ignition system in itself. For use in the shop and on trouble calls, it will pay for itself on one occasion of trouble, the manufacturer states. The S.O.S. emergency coil can be used on every multiple cylinder car excepting the Ford V-8.



20 PER CENTER. Leon Henderson, price control administrator, testifying before the House Ways and Means Committee last month during a hearing on the defense tax program. Henderson called for a tax of 20 per cent on new automobiles and urged that the tax be extended also to used cars.

AERIAL TRUCKS. Soldiers from Fort Riley, Kan., haul on the lines which nudge a huge Army truck across a chasm on cableway recently developed by Col. Lord. Bottom, a truck with a full complement of troops, ready to begin a trip. The cableway, which will carry vehicles weighing up to 25 tons, can be erected in two hours by 50 men.



DEFENSE SERVICE

ENGINEERING staffs at automobile factories are straining to find satisfactory substitutes for the long list of metals being diverted to national defense needs. Aluminum, tin, nickel, brass, and zinc, among others, cannot be spared for automobiles, and designers must fall back upon materials once used and discarded in favor of more suitable metals or upon other materials.

Fortunately for the service man, use of substitute materials will have little effect upon service methods. An exception may be the use of cast iron instead of aluminum for heads and pistons. Cast iron pistons must be fitted to closer tolerance than are required by aluminum. Since a good share of existing cars that find their way to service shops still have cast iron pistons, the knack of fitting such pistons has not been lost. It is possible, too, the lack of zinc will necessitate the use of chrome-plated stampings in grilles. This would entail some change in repair procedure.

Diversion of tin may put an end to tin-plated pistons. Uncoated pistons in new cars must be broken in slowly, but this is a concern of the owner rather than of the service man, unless the owner has grown too used to driving all out the moment he takes delivery. If he has, there may be a spell of freeing up seized pistons.

FACING THE FUTURE

ONE of the phenomena of times such as these is the speed with which reformers, zealots, and ordinary crackpots resurrect their half-baked schemes and try to foist them upon a public whose attention is distracted by weightier events. If the present follows the pattern of World War days, small, powerful groups will strive quietly but earnestly to turn the emergency to their selfish ends.

These groups derive strength from tight organization and succeed because many larger and potentially more influential groups lack organization. Automotive service men form one great unorganized group. The associations born of necessity in NRA days have almost wholly disappeared.

Here and there one hears talk of reviving service men's associations to

meet the uncertainties and problems that already have begun to disturb forward-looking operators. The impetus given union organization by sharply increased demand for labor is not the least of these worries. Interest in the idea of associations is likely to grow.

ANSWERING THE CALL

IT is estimated by the American Automobile Association that service men last year received 35,000,000 emergency calls from owners stranded on the road with stalled or damaged automobiles.

A lot of gasoline has flowed through a lot of gas tanks since the days when "Get a horse" was a wisecrack, but it's still good business to keep that tow truck tuned up and painted up.

PRESENTING THE CASE

THE current advertising campaign of the American Trucking Associations is praised by no less an authority on advertising than R. W. Yocom, advertising manager of *Collier's*. In a recent release, Yocom says, ". . . some of the finest advertising that has ever been done by any association. With clear, straight-forward facts and illustrations they are presenting to the American public, as well as to legislators, the real benefits which are bestowed upon the people because of the trucking industry. . . ."

Other divisions of the giant automotive industry might profitably study the truckers' method of carrying their case to the people as well as to law makers.

SHORT BUT PUZZLING

ONE of these days, you'll run across some odd combinations of letters in an engineering or technical article and may wonder who has been finagling with the language and why. It's nothing serious. The American Standards Association has just completed revision of its "American Standard Abbreviations for Scientific and Engineering Terms." It contains some abbreviations that look like Greek letter fraternities at first but are really simple when you get to know them. Psi, for example, is not

DETROIT NEWS LETTER

By ED WARNER

With retail sales running at the highest level in the automobile industry's history, manufacturers are faced with a real task in keeping dealers supplied with new cars and trucks. April consumer sales set a new all-time record with the sale of 557,192 vehicles, according to the A. M. A., surpassing the 537,974 units sold in April, 1929. This marked a 35 per cent gain over the same month of 1940 and was 6 per cent higher than the March, 1941, total.

In the first four months of 1941, a total of 1,874,929 passenger cars and trucks have been sold at retail in the U. S. In the same period, U. S. domestic production has totaled approximately 1,867,000, which is nearly 8000 units short of sales in the same period. In addition, the four-month production figure includes about 50,000 trucks for military use, further

accentuating the shortage. In the period when dealers ordinarily would be building up their stocks for the spring season, sales were depleting their stocks. April 1 dealer inventories of 424,225 new passenger cars constituted only about four weeks' supply at current sales levels.

New passenger car sales of 483,273 units during April marked a 37 per cent increase over April, 1940, while truck sales of 73,919 units for the month registered a 28 per cent gain. General Motors retail deliveries for April were up 49 per cent over the previous year to 272,853 units, one division accounting for more than half the total. This set a new all-time sales record for GM for the second successive month. Retail sales of Chrysler Corp. for the first quarter totaled 274,298 units, an advance of

(Continued on page 69)

the 23d letter of the Greek alphabet but the abbreviation for "pounds per square inch." Some other new abbreviations are:

kgps—kilograms per second.
var.—reactive volt-ampere.
F—degrees Fahrenheit.

LOPSIDED TAXES

SINCE the automobile industry has always held an irresistible lure for the legislator casting about for new sources of tax revenue, it seems unlikely that it can escape a part of

the additional tax burden that must be imposed to finance the national defense bill. No patriot will object to sharing the load. On the other hand, no fair-minded person will see any justification for piling more than an equitable share of taxation on the automobile industry, as has been the rule in the past.

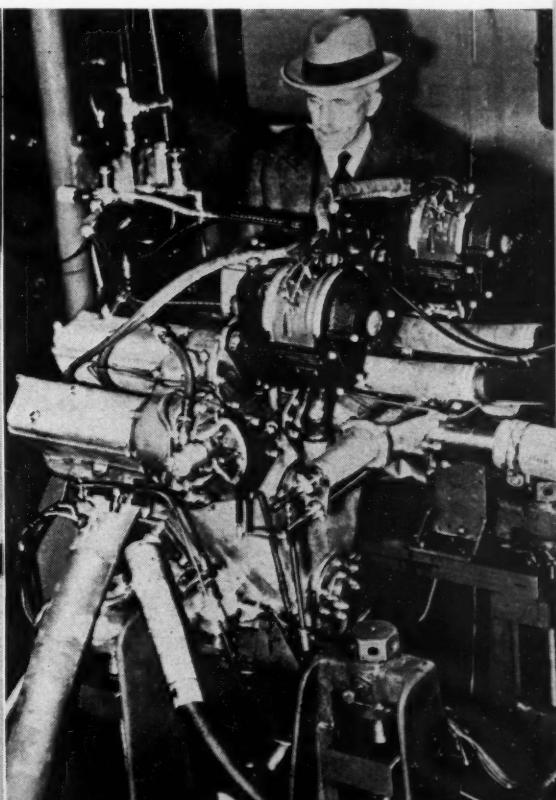
An interesting picture of the tax burden already being carried by the automobile owner is presented by the American Petroleum Industries Committee. The average value of the passenger cars on the road today, its



MODERN GRENADIER. A member of the Grenadier Guards, British regiment famous the world over for its feats of daring in years past, carries out his assignment in the present crisis with Tommy gun and motorcycle.

SCHOOL DAYS. Left below, officers from widely scattered Army camps get the low-down on automobile maintenance from M. J. Raymond, service instructor at a Chevrolet school, which will train 1,000 officers.

FORD SHOWS 12. Below, Sir Vivien Gabriel, member of the British Purchasing Commission, inspects a two-cylinder test block of a projected Ford 12-cylinder, 1,800 horsepower liquid-cooled aircraft engine.



News



INTIMIDATION-PROOF. This heavily armored truck made its appearance last month at the Weirton, Pa., plant of the Weirton Steel Co. Company officials explained that the "tank" would be used to protect its men in case of strike.

WAR WRENS. These eager British girls are members of the Women's Reserve Naval Service, who carry dispatches between the Admiralty and various naval departments.



studies disclose, is \$200; the average tax per car, the same studies show, is \$50, or 25 per cent.

On real estate, or even on income in the lower brackets, a levy of 25 per cent would be considered the next thing to confiscation.

ENCOURAGING OUTLOOK

AUTOMOBILE men visiting Washington have come away with the feeling that the cut of 20 per cent in new-car production recently announced is by no means final. Some predict deeper cuts within the next few months. This can have only one meaning for the service man; service business is entering its most active period in years.

One effect will be the clearing of used car lots by purchasers who find it impossible to obtain new cars. This assumption is based upon experience in 1917 and 1918. Domestic production of new cars and trucks fell from 1,803,164 in 1917 to 1,123,442 the next year, a drop of more than 37 per cent. Yet registrations leaped from 4,983-340 in 1917 to 6,146,617 in 1918, or 23 per cent.

The increase came from used car stocks. Such cars in the hands of new owners were far richer prospects for service than they were before they were traded in. Furthermore, higher incomes permitted owners to drive more miles, enriching the market still more.

Indication that the experience is to be repeated is given in a recent release of the National Used Car Market Reports. Basing its estimate on

the present ratio of used-car to new-car sales, the organization places 1941 used-car sales at 9,000,000.

With 9,000,000 used cars changing hands, the amount of service to be bought will be tremendous. It is reasonable to assume, however, that the increase in this particular class of service will not be spread evenly but will follow the used-car to new-car ratio in various sections. At the moment, the national ratio is 2.07, but in the East is only 1.78 and in the Middle West 1.86. The West with 2.50 and the South with 2.51 enjoy the highest ratios.

HOW'S YOUR RENT?

HOW much are you paying for rent?

Chances are, according to an interesting study just completed by Walter L. Mitchell, Jr., of Dun and Bradstreet, Inc., and published under the title, "Occupancy Expense and the Extent of Tenancy in Retailing," you are paying proportionately more than you would in any of 35 other lines of retail business with the sole exception of confectionery. Figures compiled by Mitchell reveal that about 61 per cent of all service stations operate on rented premises, and that the average station pays 6.4 per cent of its net sales for rent. Confectionery stores pay 6.6.

These facts don't mean you should hasten to buy the building in which you operate. The cost of owning a shop, according to the Mitchell study, is 7.2 per cent of net sales, but no

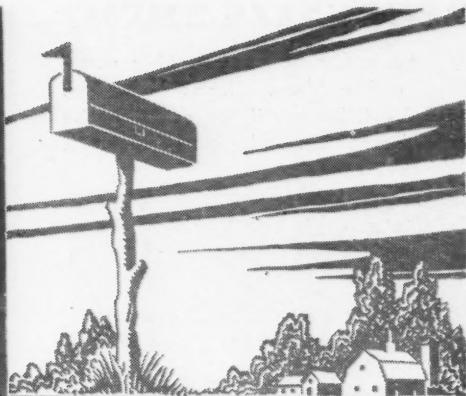
(Continued on Page 64)

New Passenger Car Registrations*

	MARCH 1941	FEBRUARY 1941	MARCH 1940	THREE MONTHS		Per Cent Change, 3 Months, 1941 over 1940	Per Cent of Total Three Months		SIX MONTHS MODEL YEAR		
				1941	1940		1941	1940	1941	1940	Per Cent Change
				1941	1940		1941	1940	1941	1940	Per Cent Change
Chevrolet.....	101,197	73,682	79,138	246,030	196,947	+ 25.3	24.60	25.20	477,925	346,532	+ 38.0
Ford.....	62,517	54,591	52,950	169,196	130,664	+ 29.5	16.90	16.88	312,179	256,454	+ 22.0
Plymouth.....	48,499	34,515	39,683	118,233	100,221	+ 17.5	11.80	12.76	234,823	166,434	+ 40.9
Buick.....	34,057	24,400	23,859	84,730	64,025	+ 32.0	8.50	8.04	173,722	138,995	+ 25.1
Pontiac.....	33,741	23,767	20,794	79,854	50,500	+ 58.0	7.90	6.32	151,390	100,929	+ 15.1
Oldsmobile.....	25,029	19,606	17,905	63,882	44,053	+ 45.5	6.30	5.54	124,136	91,818	+ 35.0
Dodge.....	21,640	15,179	19,466	53,480	49,753	+ 7.5	5.30	6.27	97,122	76,872	+ 26.1
Chrysler.....	15,128	10,405	9,077	36,334	23,290	+ 56.6	3.60	2.95	63,934	35,351	+ 81.0
Studebaker.....	10,080	7,531	8,916	25,602	22,229	+ 15.5	2.50	2.88	52,519	47,968	+ 9.5
Mercury.....	8,410	6,824	7,837	22,295	19,826	+ 16.5	2.20	2.57	41,890	38,276	+ 9.5
Nash.....	9,128	6,594	5,295	21,329	13,060	+ 63.0	2.10	1.70	34,454	26,964	+ 28.0
De Soto.....	8,809	6,023	6,348	20,964	16,398	+ 28.0	2.00	2.04	38,883	26,058	+ 49.4
Hudson.....	7,075	5,182	7,060	17,680	17,769	- .5	1.70	2.31	38,009	24,582	+ 55.1
Cadillac.....	6,058	4,685	984	15,888	8,142	+ 95.0	1.50	.04	29,767	11,848	+ 151.0
Packard.....	6,295	4,087	6,744	14,878	16,652	- 10.5	1.40	2.11	33,415	39,765	- 15.7
Lincoln.....	1,776	1,544	1,846	4,959	5,333	- 7.1	.44	.68	10,422	10,630	- 1.7
Willys-American.....	2,119	1,497	2,074	5,104	5,130	- .5	.50	.65	9,950	10,918	- 8.5
Graham.....	77	85	24	295	82	+ 26.0	.03	.01	826	332	+ 148.0
Crosley.....	27	26	61	95	145	- 34.5	.02	.02	206	303	- 32.0
Bantam.....	14	18	104	57	263	- 78.3	.01	.02	156	515	- 70.0
Miscellaneous.....	284	225	12,206	720	139	+ 52.0	.70	1.01	1,866	1,610	- 670.0
Total.....	401,960	300,466	312,371	1,001,605	784,621	+ 28.5	100.00	100.00	1,927,594	1,457,154	+ 32.1
Chrysler Corp.....	94,076	66,122	74,574	229,011	189,662	+ 21.0	22.80	24.03	434,762	304,715	+ 44.1
Ford Motors.....	72,703	62,959	62,633	196,450	155,823	+ 26.1	19.60	20.13	364,491	305,308	+ 19.4
General Motors Corp.....	200,082	146,140	146,819	490,384	363,667	+ 35.0	49.10	46.11	956,940	696,875	+ 37.1
All Others.....	35,099	25,245	28,345	85,760	75,469	+ 13.6	8.50	9.73	171,401	150,204	+ 14.2

* Complete except for March figures from Georgia and Tennessee.

† Includes La Salle.



Bill Toboldt, Editor, Motor Age

THE READERS'

CLEARING HOUSE

of Servicemen's Queries

RUNS TO ONE SIDE

I have a 1939 Buick Model 61 that leads to the right of the road all the time. I have set the front end in about all positions possible to attempt to remedy this, but without success. The car has never been in a wreck, and the owner says it has never hit the curb or a hard bump.

Camber, caster and toe-in have been changed several times, and these angles tried in different positions, but this did no good. I have balanced the front wheels, adjusted the steering, and inspected the king bolts and bushings for wear. Ray Stone, Alma, Mich.

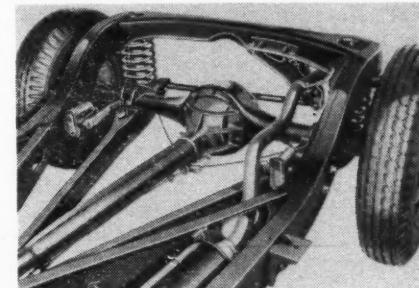
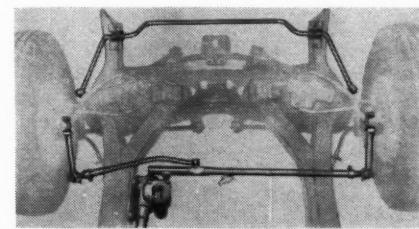
IN view of the work you have already done on this car, I am inclined to believe the trouble is due to the fact that the front and rear wheels do not track. I suggest that you place the front wheels in a straight-ahead position, remove the hub caps from the front and rear wheels, and measure the distance between the center of the front wheel spindle and the center of the rear axle shaft. Make this measurement on each side of the car and compare them so see if they are both exactly alike. If they are not, it would

indicate that the rear axle housing is not true with the center line of the car, and it will have to be lined up by adjusting the strut rods alining the torque tube with the rear axle housing.

I would recheck the steering gear in its relation to the position of the front wheels by disconnecting the

drag link at the Pitman arm after first placing the wheels in a straight-ahead position. Then I would go over the points of adjustment of the steering gear, being sure that these adjustments are made so that there is no lost motion when the gear is in the straight-ahead position. I would set the steering gear up a little tight in this position, and then adjust the drag link to the Pitman arm so that it will connect without changing the position of the front wheels. Then I would set camber and camber of both wheels to one degree positive for both angles. Toe-in should be set at not more than 1/16 in.

Even though you have the correct amount of toe-in, it would be well to check to be sure that the toe-in of each wheel is equal. Start with the wheels straight ahead, and then adjust each tie rod an equal amount so that you have a total of 1/16 in.

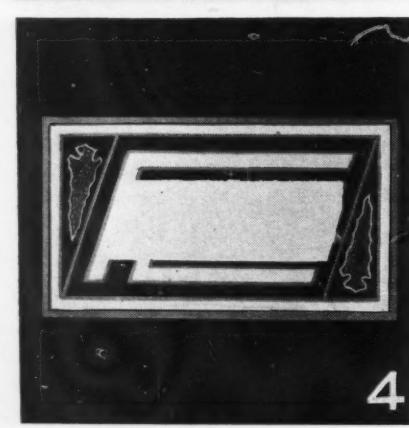
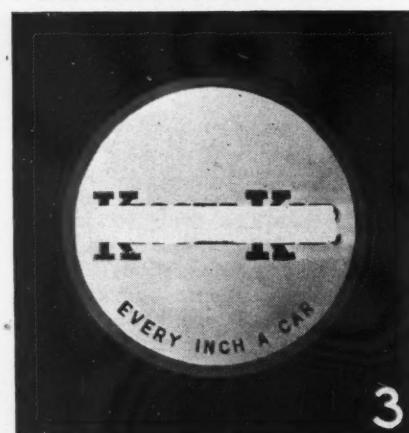


JUMPS OUT OF GEAR

We have a 1938 Plymouth that flies out of low gear when on a hard pull. We have taken the transmission down twice, have installed new cluster gears, new thrust washers, new drive

RECOGNIZE THEM?

Here are a few famous automobile nameplates and emblems. Names have been blanked out, but see if you can recognize them. Identification will be found on page 76.



gear. All bearings and shafts seem to be in good condition, yet the trouble is still there. Condon's Garage, Exeter, Neb.

ASSUMING that the new gears you have installed fit properly on the spline shaft, and that the spline shaft is true, I am inclined to believe this trouble is due to a misalignment between the transmission case and the flywheel housing. My suggestion is that you take a new gasket, tear it in half horizontally and install the lower half between the transmission case and the flywheel housing. This will have the effect of raising the rear end of the transmission and I believe will assist in placing the unit more in line with the flywheel housing. Then I would file the notch in the shifter fork rail deeper in the low-speed position and strengthen the poppet ball spring to provide additional tension at this point. It would also pay to double check the bearings.

FLUTTERING NOISE

IN MUFFLER

We have a 1939 Olds 6, driven 12,000 miles. This car runs well, has plenty of pick-up, power and speed, and idles perfectly. But, at a speed above 25 m.p.h., when you let off the gas, there is a fluttering noise in the muffler. We have checked the ignition, put in cooler spark plugs and have checked for manifold leaks, but the noise is still there. Paterson General Garage, Paterson, N. J.

MY first thought is that this car needs a new muffler. It is quite possible that some of the plates are loose inside, causing this fluttering noise. Other than this, the only condition I can think of that would cause this noise is a carburetor that is adjusted slightly on the lean side.

I would first go over the carburetor adjustment, checking it with a combustion analyzer to see what the mixture ratio is, and then try an adjustment slightly richer. If this does not correct the trouble, then I believe you will have to install a new muffler. You can inspect the muffler by tapping it lightly with a hammer. If it does not have a solid ringing sound, it should be replaced.

REAR AXLE NOISE

I am having some trouble with a 1937 Master Chevrolet sedan. This car has a very bad noise in the differential or drive shaft housing. It starts this grinding noise around 25 m.p.h., and the faster you drive the louder the noise is, until its greatest point is reached at any car speed when the engine is in balance with the speed of the car. Have had this job down three times, but still have the noise.

Installed a new rear axle housing,

new ring gear and pinion and a new front drive shaft bushing. Same noise. Next time I installed new pinion shaft bearings, front and rear, and checked the torque tube for alinement. Differential bearings appear to be O. K. Took it down again and installed shims back of the pinion thrust bearing to give correct depth of pinion teeth in the ring gear. Back-lash set at .005 in. Universal joint checked and I believe it is O. K. Two shims removed from bell housing cover for play due to wear in the bell housing and transmission case. Bell housing fits good on the drive shaft housing.

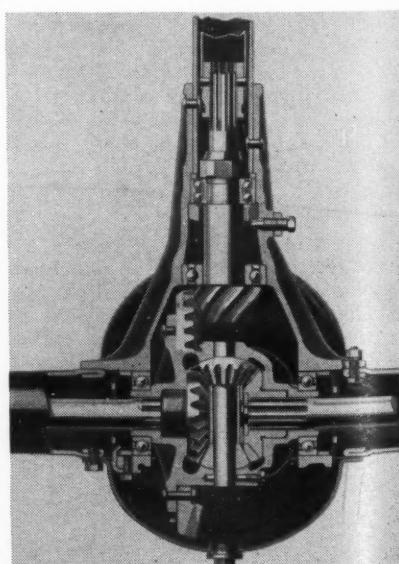
This time, after trying car on the road, found we had added one more noise to the original one, which was still there. This new noise can be heard with the car coasting out of gear. Sounds like it is in the universal joint—a clicking noise. Homer Whetstone, Oelrichs, S. D.

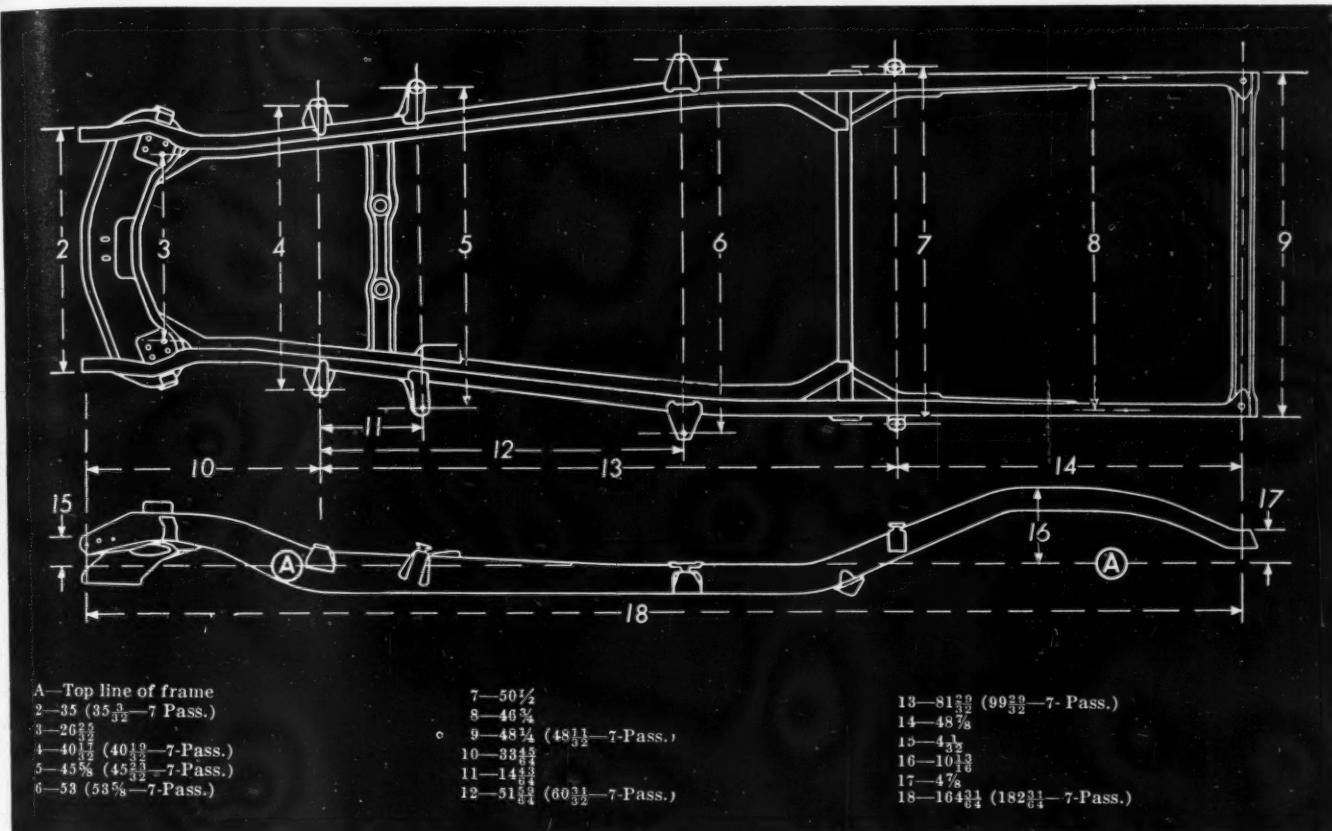
IT seems odd that, after all the work you did on that rear axle, you still have the noise. If you have checked the mesh of the pinion with the ring gear and are sure that the housing is not sprung and that all bearings are in good condition, it would seem to me that you would most likely find trouble in the transmission.

I suggest that you check the transmission, making sure the gear teeth are not worn and that the bearings are in good condition. In checking the gear teeth, I suggest that you use a magnifying glass because a slight amount of wear, which is not normally visible, will cause a noise.

I think that the clicking noise which started after working on the bell housing is caused by misalignment as a result of the installation of the shims. I would suggest that you remove the shims to see if that does not affect the noise.

Of course there is the possibility that your original noise is caused by the tires. Some tire treads and tires





Frame Diagram of 1941 Dodge
 (Dimensions in inches)

that are badly cupped will sometimes cause a noise that sounds like a ball rear.

ENGINE UNEVEN AT STEADY CAR SPEED

I have a 1937 Dodge, driven 31,000 miles. When it is pulling, it runs smooth, but, when you go to slow down, it will run very uneven. It seems to jerk the most at 40 to 50 m.p.h., and, when you step on it again, it does not take it—bucks about twice and then picks right up. Has lots of power.

I installed new plugs, points, condenser and coil, checked tappets and compression. Timing is set so I get a little tingle when it pulls hard. I have cleaned the carburetor and set the float level. C. A. Markham, Sarnia, Mich.

THERE are two conditions which I think might be responsible for this trouble, and the most likely one is that you either have a sticking valve or weak valve springs. You mention that this car has been driven 31,000 miles, but you do not mention that you have done anything to the valves other than adjust the tappet clearances. I think it might be well to do a valve and carbon job on this engine and, while you have the valves out, test the valve springs.

The other condition that might

cause this trouble is a sticking step-up piston in the carburetor. I note that you have cleaned the carburetor, but, in spite of this, it is possible that this step-up piston is sticking at times. If the valve work does not correct this condition, I suggest that you overhaul the carburetor, possibly replacing the step-up piston.

TESTING COMPRESSION

Will you please straighten me out on taking compression tests of an engine? In some of the specifications, the compression pressure figure is given at cranking speed, while in others it is given at 1000 r.p.m. I can take the compression reading at cranking speed, but how do you take

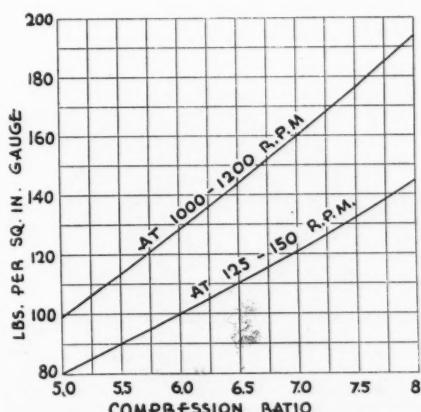
it at 1000 r.p.m.? W. R. McMann, New York City.

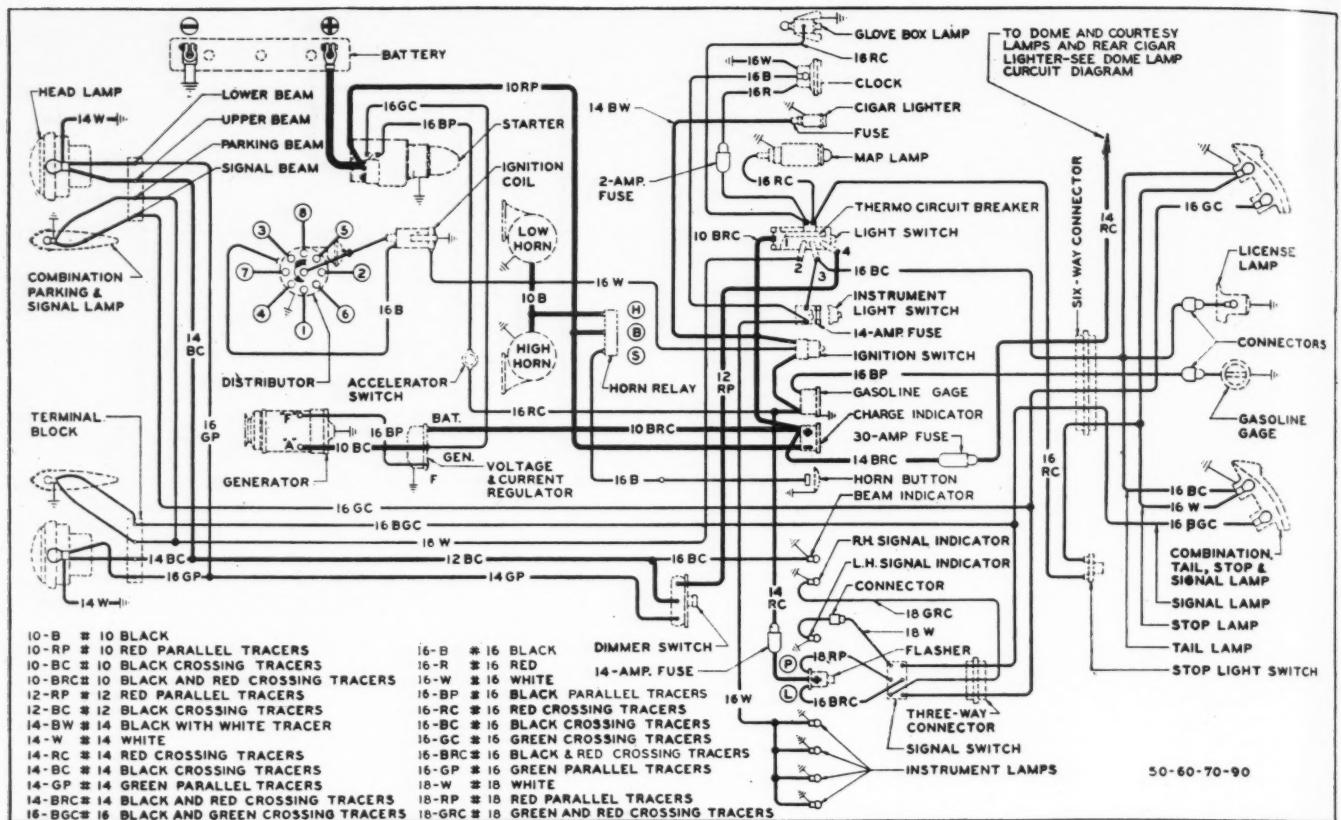
I REALIZE that this is a difficult thing to do because the only way I know it can be done is on a dynamometer. In other words, there must be some means of driving an engine at 1000 r.p.m. other than its own power in order to make a compression test at this speed.

I am reproducing a chart which has been worked out to convert compression pressure at 1000 r.p.m. to a compression figure at cranking speed. I believe this chart will be of assistance to you in checking those cars for which you have only the specifications at 1000 r.p.m. Of course, you realize that all compression tests should be made with a wide-open throttle to obtain an accurate reading.

VIBRATION PERIOD

We have been trying to lick a peculiar noise or vibration in a 1940 Series 50 Buick. It seems to be in the front of the car, and comes in at about 58 m.p.h. and lasts through 65 to 70 m.p.h. I thought it was the drive shaft housing bushing, and then it appeared to be in the front tires, but, after we tightened the fan belt it seemed to leave for a while. Later a new fan belt was installed, which we all thought had cured the trouble, but after a trip of 150 miles, the condition returned just as bad as ever.





Wiring Diagram—1941 Buick, Series 50, 60, 70, 90

This noise sounds at regular intervals and, as I said before, it is not noticeable until the car is driven over 55 m.p.h. The car has 11,000 miles on it, and I am inclined to think the vibration is in the fan. New tires have been installed, and the wheels balanced. This condition has been present for about 8000 miles. D. G. Jackson, Fort Morgan, Colo.

JUDGING from your description of that vibration in the front of a 1940 Buick, I believe it is due to the fan being out of balance. I suggest that you try running the car at the speed at which the vibration occurs, but with the fan belt removed and the fan tied so it will not rotate. If the noise does not appear, you should replace the fan assembly as it would be evident that the fan is the source of trouble.

If this does not correct the trouble, I would check the front engine mountings to be sure they are properly tightened. Then check the front shock absorbers to see that they are full of oil and operating properly. Recheck the balance of both front and rear wheels.

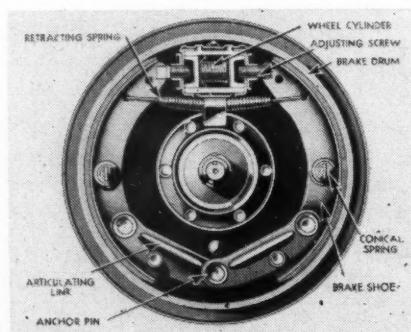
BRAKE SQUEAL

We are called upon quite often to eliminate brake squeal in 1940 Chevrolet models. We have tried several methods such as sanding the lining, equalizing the brakes, and even turning the drums down in one case, but

all without success as far as a permanent cure is concerned. Can you tell us what to do? A Florida Subscriber.

I BELIEVE you will find this noise to be caused by the brake shoes shifting sideways; in other words, they do not stay back against the backing plate as they should.

You can help this condition by strengthening the cone-shaped spiral spring which holds the shoe to the backing plate. If you are unable to get a stronger spring, you can increase the tension of this one by installing a flat washer between it and the brake shoe. You can also bend the triangular plate which is bolted to the backing plate and which carries the stud at the bottom for the articulating links. Bend this plate slightly toward the backing plate so that the bottom ends of the shoes will be drawn in toward the backing plate.

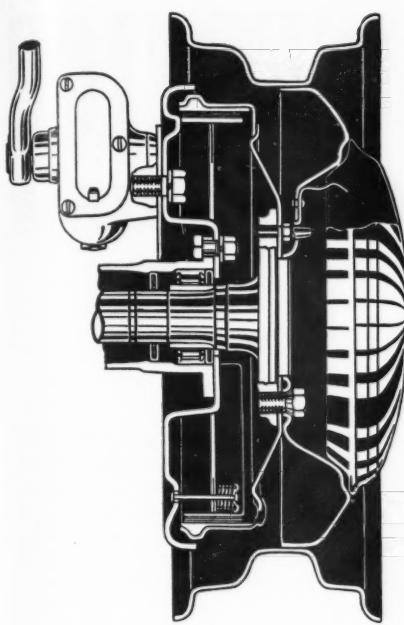


This will eliminate this noise in the majority of cases. You will find some, however, that this treatment does not affect, and, in those cases, you will lick the trouble if you will install a coil spring similar to a screen door spring around the brake drum on the outside.

LUBRICATING REAR WHEEL BEARINGS

Several rear wheel bearings I have replaced in 1939 and 1940 model Buick cars have been dry as a bone when removed. I thought these bearings were lubricated by the grease in the differential, but for some reason this grease doesn't seem to be reaching them. There is no other means of lubricating them that I can see. Will you please let me know why these bearings run dry? Jack Knesrow, San Bernardino, Cal.

THESE bearings are not lubricated from the differential. Every 10,000 miles the axle shaft should be removed and the bearing and the space between the inner and outer grease retainers should be packed with wheel bearing lubricant. These are Hyatt roller bearings, and, when you pull the axle shaft out, the inner bearing race comes with the axle shaft. The outer race and the roller and cage assembly stay in the housing. In order to pull the axle shaft, it is necessary



to open the differential housing and remove the horseshoe washers on the ends of the axle shafts.

SHOP OWNER WOULD GO TO COUNTRY'S DEFENSE

The article in a recent *MOTOR AGE* from Cliff Oppel of Duluth, Minn., entitled "Mechanic Gives Views of National Defense" is a very good suggestion.

I feel that there are many, many more of us who think the same. For myself, while I am a shop owner, I would again go in for Uncle Sam, as I did in World War I. At that time, I was inspector of aircraft and aircraft engines, under Civil Service, and working at Ford Test Field, Detroit, Mich., and working on Liberty motor inspection. These new Allisons are not too much different in general mechanics than the Liberty, from what I get from information available. I am also quite a way past draft age, but, if I can make enough to keep the home fires burning, I will team up with Cliff Oppel in mechanical work for Uncle. *H. O. White, Amberg, Wis.*

ME, TOO, SAYS MECHANIC

In the January and February issues of *MOTOR AGE*, appeared articles pertaining to training mechanics for National Defense. One of these articles was sent in by my close neighbor and good friend, Joe Halloran, of Topeka, Kan.

I also agree with Joe that you cannot train a man in six weeks to be a full-fledged mechanic. About all you could teach them in that time is the fundamental principles of the internal combustion engine. From then on, the young man must have practical experience and encouragement.

This is, in my estimation, where

the rub comes, the period between schooling and getting on the job and producing.

I believe this is where we might fit in and add a little help. We have been studying and doing this practical work for some years and, to these youngsters who are interested and willing to listen and learn from voices of experience and also put into practice what they learn in school, we should hold out our hand in encouragement and give them all the help we can. I believe the majority of you fellow mechanics will agree with me.

I spent some time in an auto school,

after my high school career; studied electricity and also Diesel engines. I have my diplomas for each of these. I have flown some and had some experience with airplane engines. Have been welding both acetylene and arc for years, and have been in the game since I was 14 and am now just 35.

Now, if any of these younger fellows feel that I can impart any knowledge, theoretical or practical, I want them to feel free to ask. I will heartily welcome any young fellow into this business, for we need more and more and more *good* mechanics. *Ted Grindol, Perry, Kansas.*



**Replace it
with a New Departure**

**... the same bearing that
competent engineers choose
for the majority of original
installations.**



Authorized replacement bearing service wherever you see this sign. Authentic records—complete stocks—sudden service.

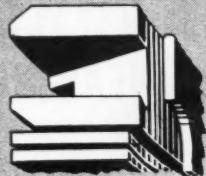
NEW DEPARTURE

THE FORGED STEEL BEARING



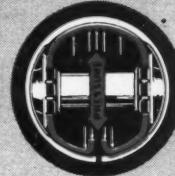
RAMCO DOUBLE LIFE PRINCIPLE

insures a cushion of cast-iron on cylinder wall . . . the inner ring spring tension is on the cast-iron segment . . . not the steel!



RAMCO PISTON EXPANDERS

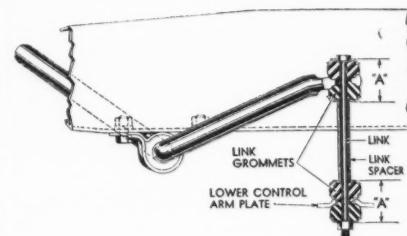
exert pressure only against the thrust sides . . . the only sides that need expansion! For all pistons including Ford Steel and Chevrolet cast-iron pistons.



SERVICE FROM THE

Riding Comfort

If lack of stability and harsh riding are experienced with the 1941 Buick, it is recommended that the adjustment of the stabilizer links be checked. These links are designed so that the nut should be run onto the link to the limit of the thread, and the dis-



tance "A" in the accompanying illustration should be 1 11/16 in. on the Series 40-50-60-70, front and rear. A tubular spacer fits around the center section of the link assembly and serves as a stop at each end for metal cups, which retain the inner rubber grommets. Check the alignment of the link to be sure that it is centered in the grommets.

Gas Mileage

In extreme cases of gas mileage complaints on the 1941 Dodge, when the engine has been properly tuned and all other points contributing to gasoline performance have been checked, the factory suggests the installation of main metering jet .057, power by-pass jet No. 58, and a new economizer piston. These parts are available in a unit package, and all three should be installed.

Locks in Gear

Some difficulty may be experienced in the early Model C-28 Chrysler cars equipped with the Vacamatic transmission that it locks in forward and reverse gears and cannot be shifted. This is due to the interlock used in the conventional transmission having been installed in the Vacamatic transmission. When such a case is encountered, the interlock should be replaced with the correct one. The procedure is as follows:

- Remove transmission.
- Remove gear shift housing.

HINTS FACTORIES

Remove cap screws holding brake support.

Loosen brake support and turn it counter-clockwise to expose the gear shift rail holes.

Slide the shifter rail out through the back of the transmission housing.

Remove the plug in the top of the transmission directly above the front end of the shifter shaft. (Plug should be removed by drilling.)

Turn the transmission over and the interlock will drop out.

Install interlock Part No. 863928 and Plug No. 103892.

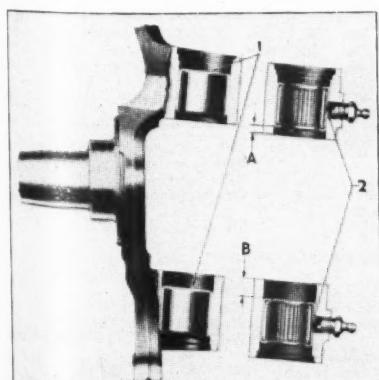
Reassemble and reinstall transmission.

Steering Road Shock

Should you encounter cases of apparent lost motion in the steering, which takes the form of road shock in the steering wheel when riding over a rough road in a 1941 Chrysler 8-cylinder car, the following is the recommended procedure for correcting this condition:

Remove the needle bearings in the lower ends of the steering knuckles, and replace them with floating bushings, part No. 871297. Also replace the rubber insulators in the ends of the steering arms with insulators that are more pliable, using part No. 871179.

Jack up the front of the car and, with the wheels in a straight-ahead position, adjust the steering gear by removing or adding shims at the base of the gear until a pull of $2\frac{1}{4}$ lb. is required to pull the steering wheel through its center position. Use a spring scale attached to the rim of the steering wheel to measure this pull.



WITH Ramco, you've got everything! 10-Up Piston Rings for all pleasure vehicles; specially designed 10-Up Rings for trucks, busses and tractors; Ramco Piston Skirt Expanders for aluminum pistons, Ford Semi-Steel and Chevrolet Cast-Iron Pistons. All backed by the strongest guarantee against oil-pumping and blow-by... the Ramco 10,000 Mile Ring and Labor Guarantee... the guarantee that makes selling ring replacements and used cars easier and more profitable. See your Ramco jobber for Plan Book or address the Ramsey Accessories Mfg. Corp., 3711 Forest Park Blvd., St. Louis, Missouri; In Canada: 144 Front Street, West, Toronto, Ontario.

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Mechanical Specifications

These Specifications Are Brought Up-to-Date Each Month by the Car Manufacturers and Supersede All Others Previously Published

MAKE AND MODEL	Lowest Priced 4-D. Sed. (Delvd.)	Wheelbase (In.)	Tire Size (In.)	No. of Cylinders, Bore and Stroke	ENGINE												CHASSIS						
					Taxable Hp.	Piston Displacement (Cu. In.)	Maximum Brake Hp. at Specified R.P.M.	Compression Ratio (to-1)	Displacement Factor \dagger	Cylinder Head Material	Camshaft Drive Make	Piston Material	Oil Cleaner Make	Air Cleaner Make	Carburetor Make	Muffler Make	Electrical System Make	Battery Make	Type and Make	Universal Joint Type and Make	Rear Axle Type and Make	Front Spring Suspension	
Buick.....41-40A	1021	118	6.50/15	8-3½x4½	30.6	248.0	115-3500	6.50	36.9	CI	LB	AI	AC	S-C	Hay	DR	DR	P-Obl	Mp-S-S	Own	4.10	IC	
Buick.....41-40B	1052	121	6.50/16	8-3½x4½	30.6	248.0	115-3500	6.50	36.4	CI	LB	AI	AC	S-C	Hay	DR	DR	P-Obl	Mp-S-S	Own	4.40	IC	
Buick.....41-50	1185	121	6.50/16	8-3½x4½	30.6	248.0	125-3800	7.00	36.0	CI	LB	AI	AC	S-C	Hay	DR	DR	P-Obl	Mp-S-S	Own	4.40	IC	
Buick.....41-60	1288	126	7.00/15	8-3½x4½	37.8	320.2	165-3800	7.00	39.0	CI	LB	AI	AC	S-C	Hay	DR	DR	P-Obl	Mp-S	Own	3.90	IC	
Buick.....41-70	1384	126	7.00/15	8-3½x4½	37.8	320.2	165-3800	7.00	39.1	CI	LB	AI	AC	S-C	Hay	DR	DR	P-Obl	Mp-S	Own	3.90	IC	
Buick.....41-90	2155	139	7.50/16	8-3½x4½	37.8	320.2	165-3800	7.00	37.3	CI	LB	AI	AC	S-C	Hay	DR	DR	P-Obl	Mp-S	Own	4.18	IC	
Cadillac V8.....61,62,63,60S	1445	126	7.00/15	8-3½x4½	39.2	346.0	150-3400	7.25	(a)	CI	LB	AI	None	AC	S-C	Wal	DR	DR	P-Long	Nb-Mec	Own	3.77	IC
Cadillac V8.....67.75	2595	139-136	7.50/16	8-3½x4½	39.2	346.0	150-3400	7.25	(b)	CI	LB	AI	None	AC	S-C	Wal	DR	DR	P-Long	Nb-Mec	Own	4.27	IC
Chevrolet M.DL & Sp.DL	795	116	6.00/16	6-3½x3½	29.4	216.5	90-3300	6.50	35.2	CI	Dia	CI	None	AC	Car	Var	DR	DR	P-Own	Nb-Own	Own	4.11	IC
Chrysler.....C-28	1051	121½	6.25/16	6-3½x4½	27.3	241.5	112-3600	6.80	35.1	CI	Mor	AI	Pur	AC	Car	.....	AL	Wil	P-B&B	rb	Own	3.90	IC
Chrysler.....C-30N, C-30K	1278	7.00/15	6-3½x4½	33.8	323.5	137-3400	6.80	41.5	CI	M-W	AI	Pur	AC	Str	.....	AL	Wil	P-B&B	rb	Own	3.91	IC	
Chrysler.....C-33	2595	145½	7.50/15	8-3½x4½	33.8	323.5	140-3400	6.80	42.0	AI	M-W	AI	Pur	AC	Str	.....	AL	Wil	P-B&B	rb	Own	4.55	IC
Crosley.....CB-41	366	80	4.25/12	2-3x2½	7.2	35.3	12-4000	5.60	....	CI	Wau	CI	None	AC	Til	Own	AL	AL	P-Ro	Mp-S	Own	5.14	C
De Soto-DeL. & Cust. S-8	995	121½	6.25/16	6-3½x4½	27.3	228.1	105-3600	6.80	35.5	CI	Mor	AI	Pur	AC	Car	.....	AL	Wil	P-B&B	rb	Own	4.10	IC
Dodge-DeL. & Cust. D-19	920	119½	6.00/16	6-3½x4½	25.3	217.8	91-3800	6.50	37.0	CI	Mor	AI	Pur	AC	Str	.....	AL	AL	P-B&B	bt	Own	4.30	IC
Ford-DeL. & Sup. DeL. 85	740	114	6.00/16	8-3.062x3.75	30.0	221.0	85-3800	6.15	33.3	CI	Dia	CS	....	Own	Own	Own	Own	P-Long	Own	Own	3.78	Tr	
Hudson-DeL. & Tr. 6.10	811	116	(d)	6-3x4½	21.6	175.0	92-4000	7.25	34.8	CI	Dia	AI	None	AC	Car	Old	AL	Na	P-Own	NB-Spi	Own	4.55	IC
Hud.-Sup. & Com. 6.11,12	952	121	(f)	6-3x5	21.6	212.0	102-4000	6.50	35.4	CI	Dia	AI	None	Un	Car	Old	AL	Na	P-Own	NB-Spi	Own	4.11	IC
Hudson-Com'dore 8.14	1085	121	6.25/16	8-3x4½	28.8	254.0	128-4200	6.50	39.6	CI	Dia	AI	None	Un	Car	Old	AL	Na	P-Own	NB-Spi	Own	4.11	IC
Hudson-Comm. Cus. 8.17	1278	128	6.50/16	8-3x4½	28.8	254.0	128-4200	6.50	37.8	CI	Dia	AI	None	Un	Car	Old	AL	Na	P-Own	NB-Spi	Own	4.11	IC
Lincoln-Zeph. & Cont. V-12	1450	125	7.00/16	12-2.875x3.75	39.6	292.0	120-3500	7.00	42.0	CI	Dia	CS	....	Own	Own	Own	Own	P-Long	Own	Own	4.44	Tr	
Lincoln-Custom.....V-12	2550	138	7.00/16	12-2.875x3.75	39.6	292.0	120-3500	7.00	37.3	CI	Dia	CS	....	Own	Own	Own	Own	P-Long	Own	Own	4.44	Tr	
Mercury.....95	960	118	6.50/16	8-3.187x3.75	32.5	239.0	95-3600	6.15	32.0	CI	Dia	CS	....	Own	Own	Own	Own	P-Long	Own	Own	3.54	Tr	
Nash-Amb. 600.....4140	780	112	5.50/16	6-3½x3½	23.4	172.6	75-3600	6.87	33.4	CI	W-D	Als	None	AC	Car	Wal	DR	AL	P-B&B	m-Mec	Own	4.11	IC
Nash-Amb. 6.....4160	930	121	6.25/16	6-3½x4½	27.3	234.8	105-3400	6.30	35.6	CI	W-D	Als	Pur	AC	Car	Wal	AL	AL	P-B&B	n-Mec	Own	4.10	IC
Nash-Amb. 8.....4180	1050	121	6.50/16	8-3½x4½	31.2	280.8	115-3400	6.30	38.2	CI	W-D	Als	Pur	AC	Car	Wal	AL	AL	P-B&B	m-Mec	Own	4.10	IC
Oldsmobile.....Special 6	945	119	6.00/16	6-3½x4½	29.4	238.0	100-3400	6.20	37.7	CI	Whit	AI	None	AC	Car	Var	DR	DR	P-B&B	m-Mec	Own	4.10	IC
Oldsmobile.....Dynamic 6	1010	125	6.50/16	6-3½x4½	29.4	238.0	100-3400	6.20	37.2	CI	Whit	AI	None	AC	Car	Var	DR	DR	P-B&B	m-Mec	Own	4.30	IC
Oldsmobile.....Custom 6	1095	125	7.00/15	6-3½x4½	29.4	238.0	100-3400	6.20	37.0	CI	Whit	AI	None	AC	Car	Var	DR	DR	P-B&B	m-Mec	Own	4.30	IC
Oldsmobile.....Special 8	987	119	6.00/16	8-3½x3½	33.8	257.0	110-3600	6.30	38.4	CI	LB	AI	None	AC	Car	Var	DR	DR	P-B&B	m-Mec	Own	4.10	IC
Oldsmobile.....Dynamic 8	1045	125	6.50/16	8-3½x3½	33.8	257.0	110-3600	6.30	39.0	CI	LB	AI	None	AC	Car	Var	DR	DR	P-B&B	m-Mec	Own	4.30	IC
Oldsmobile.....Custom 8	1135	125	7.00/15	8-3½x3½	33.8	257.0	110-3600	6.30	39.0	CI	LB	AI	None	AC	Car	Var	DR	DR	P-B&B	m-Mec	Own	4.30	IC
Packard-110.....1900	1056	122	6.50/15	6-3½x4½	29.4	245.0	100-3600	6.39	....	CI	Mor	Als	.....	AC	Str	.....	A-D	Wil	P-Long	UP	Own	4.30	IC
Packard-120.....1901	1261	127	7.00/15	6-3½x4½	33.8	282.0	120-3600	6.41	40.6	CI	Mor	Als	.....	AC	Car	Wal	AL	AL	P-Long	rb-Mec	Own	4.09	IC
Packard-160.....1903, 4, 5	1750	127-38-48	7.00/16	6-3½x4½	39.2	356.0	160-3600	6.45	43.8	CI	Mor	Als	Pur	AC	Str	.....	AL	AL	P-Long	rb-Mec	Own	4.09	IC
Packard-180.....1906, 7, 8	2587	127-38-48	7.00/16	8-3½x4½	39.2	356.0	160-3600	6.45	43.8	CI	Mor	Als	Pur	AC	Str	.....	AL	AL	P-Long	rb-Mec	Own	4.09	IC
Packard Clipper.....1951	1375	127	7.00/15	8-3½x4½	33.8	282.0	125-3600	6.85	38.5	CI	Mor	Als	.....	AC	Car	Var	AL	Wil	P-Long	rb-Mec	Own	4.09	IC
Plymouth.....P-11	780	117	6.00/16	6-3½x4½	23.4	201.3	87-3800	6.70	35.1	CI	Mor	AI	Pur	AC	Car	.....	AL	AL	P-B&B	bt	Own	4.10	IC
Plymouth-Spec. DeL. P-12	840	117	6.00/16	6-3½x4½	23.4	201.3	87-3800	6.70	36.1	CI	Mor	AI	Pur	AC	Car	.....	AL	AL	P-B&B	bt	Own	4.30	IC
Pontiac-DeL. 6.....41-25	921	119	6.00/16	6-3½x4½	30.4	239.2	90-3200	6.50	37.9	CI	Mor	CN	Own	AC	Car	Var	DR	DR	P-Inl	rb-SM	Own	4.10	IC
Pontiac-Stream. 6.....41-26	980	122	6.50/16	6-3½x4½	30.4	239.2	90-3200	6.50	37.5	CI	Mor	CN	Own	AC	Car	Var	DR	DR	P-Inl	rb-SM	Own	4.30	IC
Pontiac-Custom 6.....41-24	1052	122	6.50/16	6-3½x4½	30.4	239.2	90-3200	6.50	37.5	CI	Mor	CN	Own	AC	Car	Var	DR	DR	P-Inl	rb-SM	Own	4.30	IC
Pontiac-DeL. 8.....41-27	946	119	6.00/16	8-3½x3½	33.8	248.9	103-3500	6.50	38.9	CI	Mor	CN	Own	AC	Car	Var	DR	DR	P-Inl	rb-SM	Own	4.10	IC
Pontiac-Stream. 8.....41-28	1005	122	6.50/16	8-3½x3½	33.8	248.9	103-3500	6.50	38.5	CI	Mor	CN	Own	AC	Car	Var	DR	DR	P-Inl	rb-SM	Own	4.30	IC
Pontiac-Custom 8.....41-29	1077	122	6.50/16	8-3½x3½	33.8	248.9	103-3500	6.50	38.5	CI	Mor	CN	Own	AC	Car	Var	DR	DR	P-Inl	rb-SM	Own	4.30	IC
Studebaker-Champ. 6.3G	770	110	5.50/16	6-3x4	21.6	169.6	80-4000	6.50	39.7	CI	Dia	AI	None	AC	Car	Wal	AL	Wil	P-B&B	NB-Spi	Own	4.56	IT
Studebaker-Com. 6.11A	985	119	6.25/16	6-3½x4½	26.3	226.2	94-3600	6.50	40.2	CI	Dia	AI	Fram	AC	Str	Wal	AL	Wil	P				

Tune-Up Specifications

These Specifications Are Brought Up-to-Date Each Month by the Car Manufacturers and Supersede All Others Previously Published

MAKE AND MODEL	Compression Pressure at Cranking Speed (Lbs.)	Spark Plugs	RINGS		VALVES				IGNITION				FRONT AXLE								
			No. and Width Compression		No. and Width Oil		Inlet Seat Angle (Degrees)		Exhaust Seat Angle (Degrees)		Operating Tapet Clearance		Inlet Valve Opens Before or After T. C.		Timing						
			No. of Degrees	No. of Flywheel Teeth	Inlet	Exhaust	Inlet Tapet Clearance for Valve Timing	No. of Degrees	Breaker Points Gap (Ins.)	Cam Angles (Degrees)	Spark Plug Gap (Ins.)	Spark Occurs °TC	No. of Flywheel Teeth	Spark Occurs T.C.	Timing Marks Located	Rods Removed From	Camber (Degrees)	Toe-in (Inches)	King Pin Inclination (Degrees)		
10 IC	41-40A	AC-106	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.372	.015H	.015H	13B	5 $\frac{1}{4}$ B	.015	31	.025 2B	1B	None	A	13	3 $\frac{1}{2}$ ± $\frac{1}{2}$	31 $\frac{1}{2}$	
10 IC	41-40B	142x AC-106	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.372	.015H	.015H	13B	5 $\frac{1}{4}$ B	.015	31	.025 2B	1B	None	A	13	3 $\frac{1}{2}$ ± $\frac{1}{2}$	31 $\frac{1}{2}$	
10 IC	41-50 148x AC-106	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.372	.015H	.015H	13B	5 $\frac{1}{4}$ B	.015	31	.025 4B	1B	None	A	8	3 $\frac{1}{2}$ ± $\frac{1}{2}$	31 $\frac{1}{2}$		
10 IC	41-60 151x AC-106	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.372	.015H	.015H	14B	6B	.015	31	.025 6B	2 $\frac{1}{2}$ B	None	A	10	16 $\frac{1}{2}$ ± $\frac{1}{2}$	31 $\frac{1}{2}$		
18 IC	41-70 151x AC-106	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.372	.015H	.015H	14B	6B	.015	31	.025 6B	2 $\frac{1}{2}$ B	None	A	10	16 $\frac{1}{2}$ ± $\frac{1}{2}$	31 $\frac{1}{2}$		
18 IC	41-90 151x AC-106	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.372	.015H	.015H	14B	6B	.015	31	.025 6B	2 $\frac{1}{2}$ B	None	A	10	16 $\frac{1}{2}$ ± $\frac{1}{2}$	31 $\frac{1}{2}$		
77 IC	Cadillac V8 . . . 61,62,63,60S	182x AC-104	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.341	AA	AA	TC	TC	.0125	31	.025 5B	2B	TD	A	7	25	-1 $\frac{1}{2}$ -N2 $\frac{1}{2}$	3 $\frac{1}{2}$ -51'
27 IC	Cadillac V8 . . . 67, 75	182x AC-104	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.341	AA	AA	TC	TC	.0125	31	.025 5B	2B	TD	A	7	25	-1 $\frac{1}{2}$ -N2 $\frac{1}{2}$	5-51'
11 IC	Chevrolet Sp.DL & M.DL	AC-104	2- $\frac{1}{2}$	1- $\frac{1}{2}$	30	30	.340	.006H	.013H	.006	3B	.018	39	.040 5B	2B	Fly	A	5 $\frac{1}{2}$	14	0-+ $\frac{1}{2}$	N1 $\frac{1}{4}$ -1 $\frac{1}{2}$
90 IC	Chrysler . . . C-28 145x AL-A7	2- $\frac{1}{2}$	2- $\frac{3}{2}$	45	45	.340	.008H	.010H	.014	12B	4 $\frac{1}{4}$ B	.020	34 $\frac{1}{2}$ -38	.025 TC	TC	VD	A	5	18	N1-1-1	0-+ $\frac{1}{2}$
91 IC	Chrysler . . . C-30N, C-30K AL-A7	2- $\frac{1}{2}$	2- $\frac{3}{2}$	45	45	.340	.008H	.010H	.011	6B	2 $\frac{1}{2}$ B	.018	27-30 $\frac{1}{2}$	.025 TC	TC	VD	A	6	24	N1-1-1	0-+ $\frac{1}{2}$
55 IC	Chrysler . . . C-33 155x AL-AL7	2- $\frac{1}{2}$	2- $\frac{3}{2}$	45	45	.340	.008H	.010H	.011	6B	2 $\frac{1}{2}$ B	.018	27-30 $\frac{1}{2}$	.025 3B	1B	VD	A	6	24	N1-1-1	0-+ $\frac{1}{2}$
14 C	Crosley . . . CB-41 80 AL-A5	2- $\frac{1}{2}$	1- $\frac{1}{2}$	45	45	.311	.006C	.008C	20B	5B	.020	46	.025 TC	TC	Fly	A	3	11	6 $\frac{1}{2}$ -11	2	
10 IC	De Soto-Del. & Cust. . . S-8 150x AL-A7	2- $\frac{1}{2}$	2- $\frac{3}{2}$	45	45	.340	.008H	.010H	.014	12B	2 $\frac{1}{2}$ B	.020	34 $\frac{1}{2}$ -38	.025 TC	TC	VD	A	5	18	N1-1-1	0-+ $\frac{1}{2}$
30 IC	Dodge-Del. & Cust. D-19 142x AL-A7	2- $\frac{1}{2}$	2- $\frac{3}{2}$	45	45	.340	.008H	.010H	.014	9B	3 $\frac{1}{2}$ B	.020	34 $\frac{1}{2}$ -38	.025 TC	TC	VD	A	5	15	N1-1-1	0-+ $\frac{1}{2}$
78 Tr	Ford-Del. & Sup. DeL. 85 100 Ch-H10	2- $\frac{1}{2}$	1- $\frac{1}{2}$	45	45	(k)	.011C	.011C	TC	TC	.015	.....	.025 4B	1 $\frac{1}{2}$ B	Dist	A	5	23 $\frac{1}{2}$	4 $\frac{1}{2}$ -9	1 $\frac{1}{2}$	
55 IC	Hudson-Del. & Tr. 6 . . . 10 125x Ch-J9	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.341	.006H	.008H	.006	10 $\frac{1}{2}$ B	4B	.020	34	.032 1 $\frac{1}{2}$ B	2 $\frac{1}{2}$ B	Fly	A	6	13	0-+ $\frac{1}{2}$	1 $\frac{1}{2}$ -3 $\frac{1}{2}$
11 IC	Hud-Sup. & Com. 6 . . . 11, 12 120x Ch-J9	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.341	.006H	.008H	.006	10 $\frac{1}{2}$ B	4B	.020	34	.032 1 $\frac{1}{2}$ B	2 $\frac{1}{2}$ B	Fly	A	6	13	0-+ $\frac{1}{2}$	3 $\frac{1}{2}$ -3 $\frac{1}{2}$
11 IC	Hudson-Com'dore 8 . . . 14 119x Ch-J9	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.343	.006H	.008H	.006	10 $\frac{1}{2}$ B	4B	.017	30 $\frac{1}{2}$	.032 TC	TC	Fly	A	9	18	0-+ $\frac{1}{2}$	3 $\frac{1}{2}$ -3 $\frac{1}{2}$
11 IC	Hudson-Com'm. Cus. 8 . . . 17 119x Ch-J9	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.343	.006H	.008H	.006	10 $\frac{1}{2}$ B	4B	.017	30 $\frac{1}{2}$	.032 TC	TC	Fly	A	9	18	0-+ $\frac{1}{2}$	3 $\frac{1}{2}$ -3 $\frac{1}{2}$
44 Tr	Lincoln-Zeph. & Cont. V-12 . . . Ch-H10	2- $\frac{1}{2}$	1- $\frac{1}{2}$	45	45	.311	.013C	.013C	10 $\frac{1}{2}$ B	3 $\frac{1}{2}$ B	.015	.....	.029 4B	1 $\frac{1}{2}$ B	Dist	A	5	22	3-5	1 $\frac{1}{2}$	
44 Tr	Lincoln-Zeph. & Cont. V-12 . . . Ch-H10	2- $\frac{1}{2}$	1- $\frac{1}{2}$	45	45	.311	.013C	.013C	10 $\frac{1}{2}$ B	3 $\frac{1}{2}$ B	.015	.....	.029 4B	1 $\frac{1}{2}$ B	Dist	A	5	22	3-5	1 $\frac{1}{2}$	
54 Tr	Mercury . . . 95 100 Ch-H10	2- $\frac{1}{2}$	1- $\frac{1}{2}$	45	45	(k)	.011C	.011C	TC	TC	.015	.....	.025 4B	1 $\frac{1}{2}$ B	Dist	A	5	23 $\frac{1}{2}$	4 $\frac{1}{2}$ -9	1 $\frac{1}{2}$	
11 IC	Nash-Amb. 600 . . . 4140 120 AL-AN7	2- $\frac{3}{2}$	1- $\frac{1}{2}$	45	45	.341	.015	.015	.019	19B	6 $\frac{1}{2}$ B	.020	35	.025 TC	TC	VD	A	5	14	0 to $\frac{1}{2}$	0-1 $\frac{1}{2}$
10 IC	Nash-Amb. 6 . . . 4160 125 AC-	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.372	.015	.015	.015	12AT	3 $\frac{1}{2}$ A	.020	35	.025 6B	1 $\frac{1}{2}$ AT	VD	A	6	17	0-N $\frac{1}{2}$	1 $\frac{1}{2}$ -3 $\frac{1}{2}$
10 IC	Nash-Amb. 8 . . . 4180 110 AC-	2- $\frac{3}{2}$	2- $\frac{1}{2}$	45	45	.372	.015	.015	.015	16AT	5A	.017	28	.025 9B	2 $\frac{1}{2}$ AT	VD	A	7	16	0-N $\frac{1}{2}$	1 $\frac{1}{2}$ -3 $\frac{1}{2}$
10 IC	Oldsmobile . . . Special 6 115 AC-44	2- $\frac{3}{2}$	2- $\frac{1}{2}$	30	45	.342	.008H	.011H	.012	5B	2B	.020	35	.040 TC	TC	Fly	A	5	18	0-N $\frac{1}{2}$	N1 $\frac{1}{4}$ -1 $\frac{1}{2}$
30 IC	Oldsmobile . . . Dynamic 6 115 AC-44	2- $\frac{3}{2}$	2- $\frac{1}{2}$	30	45	.342	.008H	.011H	.012	5B	2B	.020	35	.040 TC	TC	Fly	A	5	18	0-N $\frac{1}{2}$	N1 $\frac{1}{4}$ -1 $\frac{1}{2}$
10 IC	Oldsmobile . . . Custom 6 115 AC-44	2- $\frac{3}{2}$	2- $\frac{1}{2}$	30	45	.342	.008H	.011H	.012	5B	2B	.020	35	.040 TC	TC	Fly	A	5	18	0-N $\frac{1}{2}$	N1 $\frac{1}{4}$ -1 $\frac{1}{2}$
30 IC	Oldsmobile . . . Special 8 107 AC-44	2- $\frac{3}{2}$	2- $\frac{1}{2}$	30	45	.342	.008H	.011H	.012	TC	TC	.015	31	.030 2B	1 $\frac{1}{2}$ B	Fly	A	6	22	0-N $\frac{1}{2}$	N1 $\frac{1}{4}$ -1 $\frac{1}{2}$
30 IC	Oldsmobile . . . Dynamic 8 107 AC-44	2- $\frac{3}{2}$	2- $\frac{1}{2}$	30	45	.342	.008H	.011H	.012	TC	TC	.015	31	.030 2B	1 $\frac{1}{2}$ B	Fly	A	6	22	0-N $\frac{1}{2}$	N1 $\frac{1}{4}$ -1 $\frac{1}{2}$
30 IC	Oldsmobile . . . Custom 8 107 AC-44	2- $\frac{3}{2}$	2- $\frac{1}{2}$	30	45	.342	.008H	.011H	.012	TC	TC	.015	31	.030 2B	1 $\frac{1}{2}$ B	Fly	A	6	22	0-N $\frac{1}{2}$	N1 $\frac{1}{4}$ -1 $\frac{1}{2}$
09 IC	Packard-110 . . . 1900 . . . (a)	2-(m)	1- $\frac{1}{2}$	30	45	.339	.007H	.010H	.012	1B	1 $\frac{1}{2}$ B	.020	35	.028 6B	2 $\frac{1}{2}$ B	VD	A	5	15	1 $\frac{1}{2}$ -1 $\frac{1}{2}$	0-+ $\frac{1}{2}$
09 IC	Packard-120 . . . 1901 . . . (a)	2-(n)	1- $\frac{1}{2}$	30	45	.339	.007H	.010H	.012	1B	1 $\frac{1}{2}$ B	.015	27	.028 7B	2 $\frac{1}{2}$ B	VD	A	6	17	1 $\frac{1}{2}$ -1 $\frac{1}{2}$	0-+ $\frac{1}{2}$
09 IC	Packard-160 . . . 1903, 4, 5 . . . (a)	2-(m)	1- $\frac{1}{2}$	30	45	.339	aa	aa	.018	4B	1 $\frac{1}{2}$ B	.015	27	.028 5B	2B	VD	A	7	20	N $\frac{1}{2}$ -1 $\frac{1}{2}$	0-+ $\frac{1}{2}$
09 IC	Packard-180 . . . 1906, 7, 8 . . . (a)	2-(m)	1- $\frac{1}{2}$	30	45	.339	aa	aa	.018	4B	1 $\frac{1}{2}$ B	.015	27	.028 5B	2B	VD	A	7	20	N $\frac{1}{2}$ -1 $\frac{1}{2}$	0-+ $\frac{1}{2}$
09 IC	Packard . . . 1951 . . . (a)	2-(n)	1- $\frac{1}{2}$	33	45	.339	.007H	.010H	.012	1B	1 $\frac{1}{2}$ B	.015	27	.028 5B	2B	VD	A	6	17	N1 $\frac{1}{2}$ -1 $\frac{1}{2}$	0-+ $\frac{1}{2}$
10 IC	Plymouth . . . P-11 . . . AL-A7	2-(c)	2- $\frac{1}{2}$	45	45	.340	.008H	.010H	.014	9B	3 $\frac{1}{2}$ B	.020	34 $\frac{1}{2}$ -38	.025 TC	TC	VD	A	5	14	N1-1-1	0-+ $\frac{1}{2}$
10 IC	Plymouth-Spec. DeL.P-12 . . . AL-A7	2-(c)	2- $\frac{1}{2}$	45	45	.340	.008H	.010H	.014	9B	3 $\frac{1}{2}$ B	.020	34 $\frac{1}{2}$ -38	.025 TC	TC	VD	A	5	14	N1-1-1	0-+ $\frac{1}{2}$
10 IC	Pontiac-DeL. 6 . . . 41-25 155x AC-45	2- $\frac{3}{2}$	1- $\frac{1}{2}$	30	45	.312	.012H	.012H	.015	5B	2B	.020	37	.025 4B	1 $\frac{1}{2}$ B	Fly	A	6	18	N1 $\frac{1}{2}$ -N1 0	0-1 $\frac{1}{2}$
10 IC	Pontiac-Stream. 6 . . . 41-26 155x AC-45	2- $\frac{3}{2}$	1- $\frac{1}{2}$	30	45	.312	.012H	.012H	.015	5B	2B	.020	37	.025 4B	1 $\frac{1}{2}$ B	Fly</					

Motor Car Price, Weight and Body Table

Following are delivered prices at factory for cars with standard equipment and include all federal taxes with exception of Ford, Lincoln-Zephyr, Mercury and Willys. Optional equipment, state or local taxes, transportation charges and finance charges are extra.

*—Shipping weights revised to car without running boards.

Butler Is Again Chosen

Blue Book-Red Book Head

Meeting at Chicago, directors of the National Used Car Market Report, Inc., re-elected W. Earl Butler as president, Charles E. Gambill as vice-president, Harry T. Hollingshead as secretary, and Henry Paulman Jr., as treasurer for the coming year. George A. Leukhart was reappointed as general manager. Butler, whose firm is located in Chicago, rates as the nation's leading Hudson distributor, Gambill heads the Packard distributorship in Cleveland, while Hollingshead is president of Nash Sales, Inc., of Chicago.

GM To Train Army Officers on Truck Maintenance

Specialized factory training in Army truck service and maintenance will be given by the service division of General Motors Truck and Coach to approximately 1000 commissioned officers of the U. S. Army, according to the announcement made by truck company officials recently. This intensive program is to acquaint U. S. Army officers with mechanical details of the trucks which GMC has been building for the Army since last fall.

The present schedule calls for a new class of 30 officers to convene each week for the next eight months. Officers come from forts and army posts in all parts of the United States to participate in the school.

Training Literature Ready

Availability of literature for use in emergency training of defense workers for a wide variety of occupations is announced by the Emergency Defense Training Committee of the American Society of Tool Engineers, headed by O. W. Winter. The bulk of this literature is made available at cost through the cooperation of the Bureau of Industrial and Technical Education for the State of New York and covers courses in teaching the following subjects:

Heat treatment, job series, measurements, drill press, bench work, blue print reading, lathe operation and shop mathematics.

All except the last two are already available. Milling machine and shaper operation courses will be ready July 1, according to the committee.

Fewer Standard Steels

Listed by SAE Handbook

Comprehensive revisions of SAE steel specifications have just been published. Reversing the trend of increasing variations in the chemistry of steels demanded by users in recent years, the revised standards provide for 72 carbon and alloy grades and 12 corrosion and heat-resisting alloys

—a total of 84 in place of the 109 SAE standard steels included in the series which they replace.

The revised series (which appears in the 1941 SAE Handbook published just a few days ago) is the result of nearly a year's work by the Iron and Steel Division of the SAE Standards Committee, the last previous general revision in these specifications having been made in 1935. Carrying out the present important revisions Division Chairman F. P. Gilligan sought and obtained data on use of SAE steels from machine tool

builders, electrical manufacturers, railroads, and scores of other non-automotive users as well as from every part of the automotive industry itself.

Final decisions were reviewed in cooperation with a technical committee of the American Iron and Steel Institute which had recently completed a survey restricted to steel producers and, in general, the conclusions reached by the two separate groups with respect to popular and desirable SAE compositions were similar.

Exclusive!

only McQUAY-NORRIS

Factory Type Set

PISTON RINGS ARE MADE OF

ELECTALLOY AND ALTINIZED

*...and man,
what a difference
that makes!*

MADE TO OUTPERFORM

PRICED TO OUTSELL

Exclusive! 4 Different Types OF STEEL OIL RINGS ARE NECESSARY TO MAKE

Engineered PISTON RING SETS

LEGALLY SPEAKING

A lawyer's interpretation of Federal and local court decisions of interest to repairmen, presented each month

by C. R. ROSENBERG, JR.

How Long to Act?

Sometimes a contract specifies no definite time within which the parties are to "perform" under the terms of the contract. This is frequently the case with oral agreements. Nothing is said as to just when goods are to be delivered or payment is to be made.

"Where a contract fixes no express time within which its terms are to be performed, a reasonable time will be implied. This rule applies with reference to any future act to be performed under the contract."

But nobody seems to know just what a "reasonable time" is. The law says it depends on the facts in the particular case. (*Bancroft vs. Conyers*, 10 Southeastern Reporter, second series, 286.)

"And He Also Promised - - "

Repairmen signing contracts might as well forget the things that were orally promised by the other party or his representative, for such oral promises cannot be enforced unless they have also been included in the written contract.

"The purpose of a written contract," said the Supreme Court of Utah in a recent case, "is to put in definite form the terms upon which the minds of the parties to the contract have met. The express terms of the written contract may not be changed or nullified by parol testimony, nor

may such parol testimony antecedent to the reduction of the agreement to writing be considered where the language of the agreement is clear and unambiguous."

"Parol" means oral, and you can't put something into or take something out of a written contract by telling about the other fellow's oral promises. If you attempt to tell about those oral promises, the lawyer on the other side will show that you're just a chiseler who is trying to get more than he is entitled to.

Maybe you have plenty of witnesses who heard those oral promises made. Too bad, but oral testimony is not "admissible" to vary a written contract. Meaning that neither you nor your witnesses will be permitted to open your mouths about it!

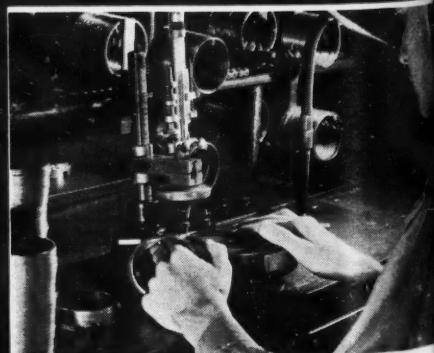
Moral: Before you sign a contract, make sure it contains everything you want in it and nothing that you don't want. (*Erickson vs. Bastian*, 102 Pacific Reporter, second series, 310.)

"You'll Have to Be Searched!"

The employee of a business house suspected that a certain man had stolen a sum of money from an automobile at his place of employment. The accuser did not believe the suspected man's denial and demanded that he be searched.

Then, according to the suspected thief's petition later filed in court:

"The manner of the accuser's ac-



The rings that are

McQUAY



are engineered in fact as well as name!

tions and the tone of his voice made it clear that there would be further serious trouble if plaintiff did not allow himself to be searched, so in view of all these circumstances he permitted himself to be detained there against his wishes and to be searched. The accuser personally searched plaintiff all over in the presence of several people and did not find his money on plaintiff's person."

"The plaintiff," said the Georgia court, "might reasonably assume that force would be used to restrain him from leaving or refusing to be searched if he did not consent to be searched."

The facts, concluded the court, were sufficient, if proved, to make out a case of false imprisonment.

Pretty expensive at times to get "tough" on suspicion only! (*Meek vs. Sinclair*, 10 *Southeastern Reporter*, second series, 76.)

Demented Customer

Ordinarily, a lunatic cannot be held liable in any transactions or contracts he undertakes, because in the legal view he lacks "contractual capacity." He is simply incapable of making a legally binding contract.

But what of the repairman who sells on credit or otherwise commits himself in a transaction with a customer who seems sane and sensible enough but who turns out to be demented? Must the repairman lose his money?

"The burden," said the Supreme Court of Alabama recently, "is upon the party attacking the transaction to show insanity at the very time of the transaction. Proof of failing health does not put one on notice that the person with whom he deals in a business transaction is mentally incompetent. Where such person was transacting his business in the usual and

ordinary way, and there was nothing about his conduct to impress upon those coming in contact with him that his mind was impaired, then there is no notice of such mental incapacity to persons dealing with him."

Under this sensible decision, a repairman has the right to assume that those with whom he deals are mentally competent unless there come to his attention facts and conduct tending to arouse his suspicions. (*Equitable vs. Welch*, 195 *Southern Reporter*, 554.)

Sale of Refused Goods

Sometimes a purchaser refuses to take and pay for goods bought, although there is nothing wrong with them. In this situation, the seller has his choice of several remedies under the Uniform Sales Act.

"The seller," explained a Georgia court, "in such a case may retain the goods and recover the difference between the contract price and the market price at the time and place of delivery; or he may sell the goods and recover the difference between the contract price and the price on resale; or he may store and retain the goods for the purchaser and sue him for the entire price."

Discussing the situation in which the seller plans to resell the goods and hold the original purchaser liable for the difference between the contract price and the price on resale, the court continued:

"However, before the original purchaser shall be liable for such difference, it must appear that he was notified of the seller's intention to resell at the original purchaser's risk. Such notice of intention to resell is essential to the exercise by the seller of the right of resale." (*Tybee vs. Acorn*, 10 *Southeastern Reporter*, second series, 224.)

and McQUAY-NORRIS makes **4 types** .

McQuay-Norris Engineered Piston Ring Sets are not the same old rings with a different label. They are not like ordinary ring sets in which the same designs and types are supposed to work in all cars. When you get McQuay-Norris Engineered Sets, you get the right rings for the particular car on which you are working and you get the job done right.

McQUAY-NORRIS MANUFACTURING CO.
Piston Ring Headquarters

Service Stations Increased

Facilities for the servicing of automobiles using the \$70,000,000 Pennsylvania Turnpike between Pittsburgh and Harrisburg will be approximately doubled by the Esso Marketers, who announced that work has already been started on a \$500,000 improvement and enlargement program at their ten service stations along the 160-mile route of the so-called Dream Highway. A new service station will be erected seven and one-half miles east of the western terminus of the highway at Hempfield, and parking, dining and gasoline pumping facil-

ties will be substantially increased at the various service stations, which were completed last fall at a cost of \$600,000 in one of the largest single service station construction programs in many years.

Named District Chief

Of interest to Dodge-Plymouth dealers of the northern district of the Minnesota Region of the Dodge organization is the appointment of H. E. Berrell as manager of the district. Berrell replaces G. V. Kiefer who has been transferred as district manager to Sioux City.



Exclusive!



"THESE BABIES STOP
OIL TROUBLE RIGHT
AT THE SOURCE!"

McQUAY-NORRIS
BEARINGS
ARE COMPLETELY BROACHED
NOT BORED!

**THE COMPLETE BEARING LINE WITH
COMPREHENSIVE UNDERSIZE SERVICE**

Hunt Renamed President by Buffalo Dealer Body

Percy J. Hunt was re-elected president of the Buffalo Automotive Trade Association at the annual banquet in Hotel Statler. Other officers for the coming year are: Vice-president, Ralph A. Young; secretary, Stewart H. Gibson, and treasurer, Harry D. Elliott.

The following in addition to Hunt were re-elected directors for the two-year terms: Thomas J. McElvein and George C. Ostendorf. Gibson was elected a new director. Leslie M. Farr was appointed an associate member director. James C. Crosby is a hold-over director.

Tool Engineering Course Proposed for Colleges

Details of a proposed general curriculum for college courses in tool engineering have been released by the National Educational Committee, American Society of Tool Engineers.

The curriculum which is already under consideration by several universities and engineering colleges, is designed to place the science of tool engineering on the same fundamental basis as mechanical, civil, and electrical engineering, etc.

Lack of availability of such courses in the past has been largely responsible for the shortage in tool engineers to expedite the national defense program.

The new college course in tool engineering comprises four years of study. It differs from the average conventional engineering course in that there is a considerably closer tie-up between theoretical studies and practical problems in industry.

For Thousands and Thousands
of Service-Free Miles



THE RICH VALVE
of Silcrome-X Steels

McQUAY-NORRIS JOBBERS

SHOP KINKS



TOOL CHEST

My service truck has no place to carry tools except in the ordinary tool box, which means that the tool you want is always on the bottom, and the box has to be just about emptied every time you want something. So I made a tool chest, as shown in the illustration.

It is made from a 50-lb. grease drum. A double door was made by cutting the side of the drum, and installing hinges and a hasp. Then I made a four-blade rotor out of $\frac{1}{4}$ -in. plywood, patterned after a butter churn blade. In the top and bottom of this rotor I placed a piece of $\frac{1}{8}$ -in. iron pipe. Then I drilled a hole in the top and bottom of the drum, inserted the rotor in the drum and held it in place by a bolt through the top and bottom of the drum, the bolts extending into the $\frac{1}{8}$ -in. iron pipe. This acts as a pivot, so that the rotor can be turned around, exposing each section of the rotor to the opened door.

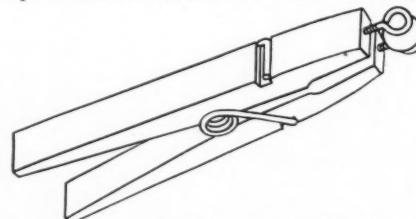
With the tools hung on small hooks screwed into the rotor, everything is



in place and will not shake off while the truck is in motion. Now, when I want a certain tool, I don't have to paw through the whole toolbox to find it. *Allan E. Oberland, Lisbon, N. D.*

HANDLING BALL BEARINGS

A simple device which will help in handling the individual balls of a ball bearing so they can be picked up and placed in position in difficult spots can be made from an ordinary



spring-type clothespin. Whittle the front tips of the pin until they are flush. Then insert a small screw-eye in each tip so the eye circles face each other and may thus be used to grasp the sides of the ball.

LOW OIL PRESSURE

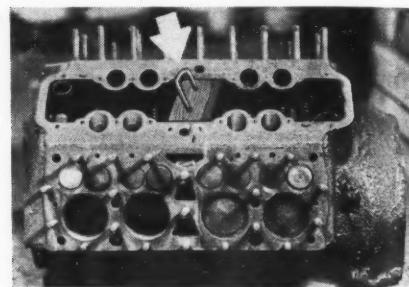
Now and then you may run into a late model Buick (1939 or 1940) that has been driven in excess of 12,000 miles, and which loses oil pressure at low speed.

Instead of going through the usual procedure to boost the oil pressure, first look at the plate on the bottom of the oil pump. We have found that some of these warp, allowing an excessive clearance between the inside of the cover and the gears, with the result that the pump cannot put out its normal pressure. If you find this plate slightly warped when checking on a surface plate, install a new one and the oil pressure will come back up to normal.—*Lyle Schwartz, Clauss Motor Co., New Ulm, Minn.*

FORD ENGINE

HOISTING BLOCK

Not having any special tackle for lifting a Ford engine out of the frame, I make something which I find works as well as anything I have seen. It is made of a good piece of oak 2 in. x 4 in., and 8 in. long. Bore two holes in the center so that a spring U bolt can be inserted. Install washers and nuts on the U bolt.



Remove the manifold from the engine and insert the hoisting block between the center intake ports. Turn the block a quarter turn, hook the chain-fall to the U bolt, and you have a hoisting block that will stay in place and handle the engine easily. *Ross Welch, Bunker Hill, Ill.*

INSTALLING MIDDLE

UNIVERSAL JOINT

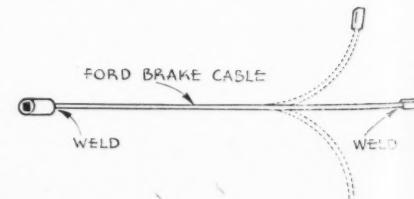
Here is a short cut I have found that saves time when it is necessary to either remove the transmission or install a new middle universal joint in a $1\frac{1}{2}$ -ton Chevrolet truck.

Remove the two nuts that hold the universal joint support, then remove the cap screws from the bell housing retainer. Next, lower the drive shaft until it will slip out of the joint. Remove the cap screw that holds the joint to the front propeller shaft, using a T handle and a $9/16$ in. socket. This will let the joint slip off.

This method saves the trouble of splitting the universal joint.—*Ray Luttrull, Dixie Bee Line Garage, Trenton, Ky.*

FLEXIBLE EXTENSION

Here is a flexible extension I made, and find it very handy. It is made from a Ford brake cable. Weld a female $\frac{3}{8}$ in. drive socket on one end,



and a male drive socket on the other. This will enable you to get a socket on those hard-to-reach jobs. *H. L. Cofer, 326 Park Avenue, Elizabethtown, Ky.*

Evidence Like This Proves . . .

ONE OIL IS NOT GUILTY!

These three unretouched photographs show the results of tests of three nationally sold, popular brands of motor oil.



SLUDGE...TRACE

Stabilized Quaker State Motor Oil. After comparative test . . . the oil pump screen is almost spotlessly clean.

SLUDGE...PLENTY

30¢ motor oil. After comparative test . . . oil pump screen is badly clogged with deposit of hard granular sludge.

SLUDGE...VERY BAD

25¢ motor oil. After comparative test . . . screen almost completely clogged with both soft buttery and hard sludge.

• It's oxidation that causes nearly all sludge, varnish and acids in motor oils. And when Quaker State developed a way to get rid of the unstable elements that promote oxidation in motor oils . . . it took a long step forward in lubrication. The New Stabilized Quaker State Motor Oil is cleaner, better, safer in every way. It gives greater protection and greater satisfaction than ever.

Prove for yourself, in your own car, how far science has progressed toward elimination of the damage and annoyance caused by inferior lubricants.

You will then be happy to recommend the New Stabilized Quaker State Motor Oils to your friends and customers. Quaker State Oil Refining Corporation, Oil City, Pennsylvania.

The New

STABILIZED QUAKER STATE MOTOR OIL

JUNE, 1941

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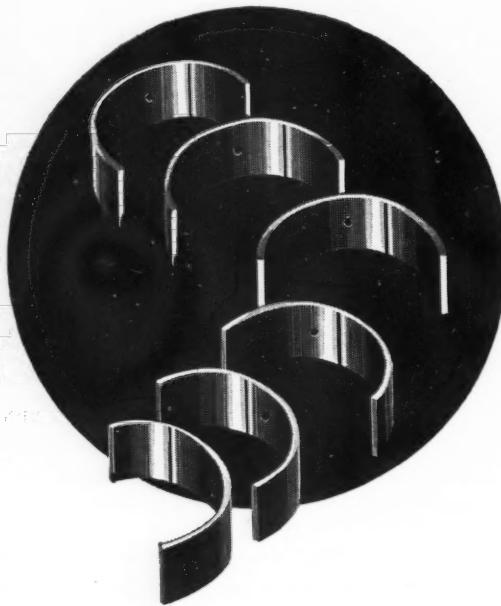
Designed to make it easier to haul wrecks to the shop over mountainous roads around the city, this light trailer was built by the Oden Motor Co., Albuquerque, N. M., in its own shop. It has a power winch for loading the wreck and, with its present tires, will carry 5,000 pounds. Weighing only 1,900 pounds, the trailer will travel 75 miles an hour behind a pick-up truck.



Johnson Slip-in Bearings for Greater Performance

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Write for
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- The same high quality materials . . . the same exacting and precise treatment, required in the production of original equipment, goes into the Johnson line of replacement bearings. That is why they are so easy to install and why they deliver such exceptional performance. There are no second or third grades of Johnson merchandise. Try a set on your next job. There's a stock at your local dealers -- for all types of cars.



JOHNSON BRONZE
Sleeve BEARING HEADQUARTERS
455 S. MILL STREET • NEW CASTLE, PA.

HOW'S YOUR RENT

(Continued from Page 46)

explanation is offered for the higher figure. Possibly some of the increase may be accounted for by the fact that service men often buy their shop only after they have operated a successful business at the location for some years and have thus increased the value of the property.

Under present conditions, the difference between costs of renting and owning is likely to change. A general price rise would inevitably be reflected in higher rents.

Perfect Circle Ring Sales Establish All-Time Record

During the first three months of this year, the Perfect Circle Co. manufactured and sold 25,457,353 piston rings, it is reported by the Replacement Division. This is an all-time record for the company.

Compared with the same period last year, during which 19,126,377 rings were made and sold, this 1941 figure represents a gain of 33 per cent.

Globe Publishes

Interesting Booklet

An interesting booklet illustrating different types of Globe hoists has been issued by Globe Hoist Co., 1000 E. Mermaid Lane, Philadelphia, Pa. In addition to the regular automobile hoists for lubrication departments, the booklet illustrates loading platforms and boat hoists. An explanation of the Rock-a-Car jack is included, along with pictures of truck and bus fleets kept in condition on Globe hoists.

Named Sales Manager

H. S. Sherwood has been appointed sales manager of LUBE-X Systems, Inc., Chicago, Ill. Sherwood has been actively connected with petroleum products marketing for the past 12 years.

DETROIT LETTER

(Continued from page 44)

28 per cent over the first quarter of 1940. Currently, Chrysler sales are at a rate of 33,000 vehicles weekly, according to President K. T. Keller.

A total of 61,817 military vehicles were delivered to the U. S. and non-Axis governments from Jan. 1 to April 15, according to the briefs submitted by the truck manufacturers to the OPM in conjunction with the 20 per cent curtailment in 1942 model production. These are part of the 137,000 military vehicles to be produced for the U. S. Army in the year ending July 31 to provide transportation for an army of 1,418,000 men. Truck registrations now total 4,650,000 units, nine times greater than in the 1917-18 war period.

A bigger federal excise tax variously estimated at 7 to 15 per cent is anticipated by Detroit automotive circles, in contrast to the present 3½ per cent, although they hardly expect Leon Henderson's recommendation of 20 to 25 per cent to be imposed. July 1 or Aug. 1 is looked for as the likely date for the higher levy to take effect. An additional increase of 5 to 10 per cent in 1942 model prices to take care of increased labor and material costs also is quite possible. GM, Ford, Chrysler and several other companies have granted wage increases since the 1941 models were introduced. Ford recently increased the price of 1941 models \$15 per car, while Studebaker put through a \$25 increase on certain models several months ago.

The total for 1942 model production has been set at 4,224,152 vehicles by the OPM, a reduction of 20.15 per cent, or 1,065,820 units, from the projected 1941 model output. Companies making less than 2000 units were not curtailed. Companies making trucks exclusively, such as International Harvester, GM Truck, Mack and White, were cut 5 to 10 per cent. General Motors, Ford and Chrysler each received a reduction of 21.5 per cent, while Studebaker, Hudson, Packard and Nash were cut 15 per cent. Willys' output was reduced 5 per cent. No further reductions are looked for before fall, although shortages of labor or materials may serve to cut 1942 model production even lower than the quotas already set. It also is provided that the production situation will be reviewed about Nov. 1 by the OPM, possibly with the view to further restriction of 1942 model production for the second half of the model year.

Ford released its new six-cylinder engine to dealers in mid-May. It will develop 90 h.p., same as the V-8, and will be priced \$15 under the eight. At first it will be available only in trucks, its passenger car introduction awaiting the 1942 models. The six is

interchangeable with the eight. Less than 1 per cent of Ford's daily output of 5000 engines will be six-cylinder jobs at present.

Production in the industry during May reached a four-year high, totaling an estimated 552,000 units, with the possibility it might even surpass the 553,231 units produced in April, 1937. The latter is the biggest month in the industry's history with the exception of four record months in 1929. It will mark the second best May on record, exceeded only by May, 1929, when output was 636,250, and is 34 per cent greater than May, 1940.

Heads Chemical Sales

A. B. Van Sciver has been appointed chemical specialties sales supervisor in the Chicago district by E. I. du Pont de Nemours & Co., succeeding L. J. Webster, who died suddenly April 5. Van Sciver has been representing the company for the past several years in eastern Pennsylvania, and was headquartered in Philadelphia. Van Sciver's new territory extends from Duluth to southern Illinois, and west to Kansas City, Mo. The Chemical Specialties representatives in this area will operate under his supervision.

"WE ARE CHARGING MORE BATTERIES THAN EVER BEFORE"

— says *Bud's Service Station*
Indianapolis, Ind.

FROM all over America come unsolicited testimonials of how B-L Superchargers are making money—Bigger profits for their owners. Proof of this kind—"Indispensable in servicing used cars"—"Practically does away with rental batteries"—"Decreased our power bill"—"Charging enough batteries to pay for the machine in a year"—"Doubled our battery business"—"Gives customers faster service, wins more customers"—"Recommend it highly to any one desiring to make more money."

Don't compromise quality! Insist on a B-L Supercharger—built up to a high standard of efficiency, performance and design by skilled, advanced engineering; not down to a price.

Your customers are demanding quick, convenient battery service. Don't let your competitors supply it!



YOU GET ALL THESE FEATURES IN THE B-L SUPERCHARGER:

- ★ Automatic Time Clock
- ★ 100 Ampere Output
- ★ Dry Plate Rectifier
- ★ Sealed Bearing Fan
- ★ Extreme Portability
- ★ High Rate Testing and Cycling Discharge Unit
- ★ Single Meter for Testing and Charging
- ★ Taper Charge—Automatic Step Down Rate
- ★ Magnetic Overload Circuit Breaker
- ★ High Charge Rate of 2-4-6-12 V. Batteries

The BENWOOD-LINZE COMPANY

"Over 20 Years Experience in Building
All Types of Industrial Battery Chargers"

1872 Washington Ave., St. Louis, Mo.

WRITE TODAY!

for complete information on this Super-Battery Servicer and Profit-Maker.

Name _____

Address _____ State _____

City _____

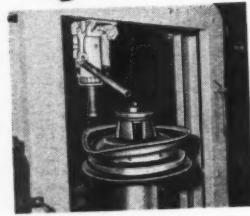
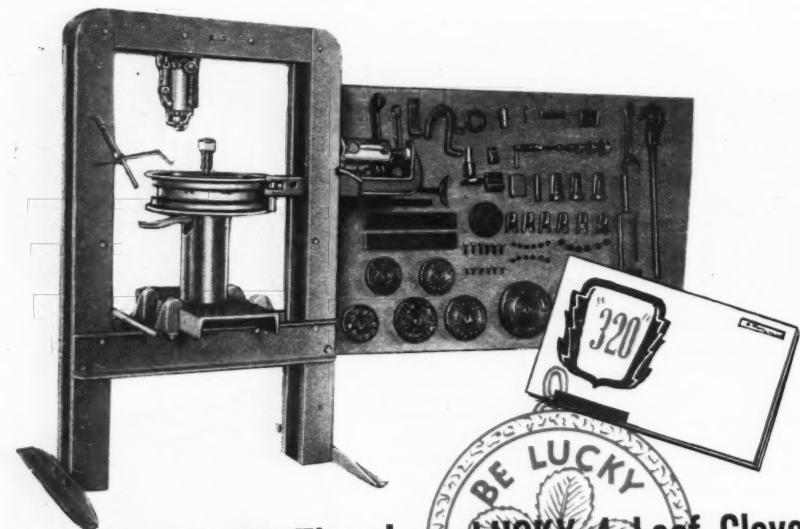
Annual Service Industries Show Is Scheduled for Atlantic City

Pursuant to the signing of an agreement among the three sponsoring associations to hold an Automotive Service Industries Show, the joint operating committee has announced the scheduling of such a show for Atlantic City, N. J., Feb. 23 to 28, 1942.

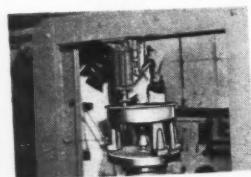
The first step toward the next show was the signing of a presidents' agreement, in which the Motor & Equipment Manufacturers Association: J. E. Adams, Toledo, Ohio; W.

sociation, and the Motor & Equipment Wholesalers Association expressed their intention of cooperating in the holding of a trade exposition and in setting up the basic arrangements therefor. Pursuant to the formulation of the presidents' agreement, the joint operating committee representing the three sponsoring associations met in Chicago March 27.

The committee for this year is composed of the following:



Straightens Wheels,
Rims, Spokes,
BRAKE DRUMS
and HUBS!



Write Now for your Free
Lucky 4-Leaf Clover and
"320" Booklet! Ask
about Bear Jobbers' Easy-
Payment-Plan. Bear Mfg.
Co., Rock Island, Ill.

**There's a LUCKY 4-Leaf Clover
Tied to this free Bear "320"
Wheel Straightener Bulletin!**

Send for Both-today!

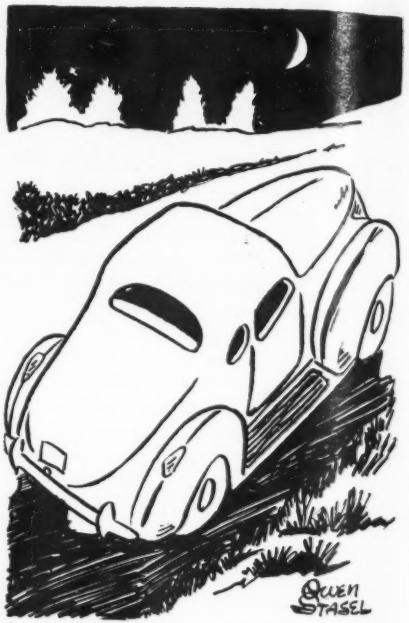
• This is a "tie-up" you can't afford to overlook because it means dollars and cents in your pocket! The FREE Bulletin tells all about the new construction features of the Bear "320" Wheel and Hub Straightener that provide a faster, easier method of mounting steel or disk wheels for correcting all distortions such as bent rims and spokes, eccentric wheels, damaged hubs, etc., etc. Shows why the "320" does not require individual dies—adjustable steel fingers fit any hub. Explains the advantages of Bear overhead and portable hydraulic jacks... complete tool assortment... movable bed and adapters... wheel locking mechanism and checking gauge that is used while wheel is mounted in position.

• In Addition—you get the support of Bear National Advertising in TIME and COLLIER'S magazines that doesn't cost you a penny... Free 4-Leaf Clover Lockets for your customers... Bear indoor and outdoor signs... window and wall posters... newspaper ads... postcards... etc., etc. It's a Program you can't get with any other safety test and correction equipment!

Copyright, 1941, Bear Mfg. Co.

Be the lucky one!

GO with BEAR in 41!
Bear Mfg. Co., Rock Island, Ill., Today.



"George, that alibi is no good—the gear shift is on the steering wheel!"

Motor & Equipment Manufacturers Assn.: J. M. Spangler, New York City; R. D. Black, Towson, Md.; C. P. Brewster, Lancaster, Pa.; B. G. Close, St. Louis, Mo.

National Standard Parts Association: J. E. Adams, Toledo, Ohio; W. J. Menghini, Springfield, Ill.; D. H. Teeter, Hagerstown, Ind.; M. F. Wible, Greensburg, Pa.

Motor & Equipment Wholesalers Assn.: G. E. Johnson, Roanoke, Va.; C. E. Owen, Tyler, Texas; F. G. Stewart, Washington, D. C.; W. F. Wilkerson, Casper, Wyo.

The committee organized by electing J. M. Spangler chairman, and M. F. Wible, vice-chairman. Sub-committees were appointed on credentials, publicity, disbursements, space contracts, badges, time and place for holding the show. The committee also named A. B. Coffman, of Chicago, to act as manager, and Herbert Buckman, of Cleveland, as secretary of the joint operating committee.

Following scrutiny of all of the factors bearing on the selection of both time and place, the sub-committee on time and place reported to the general committee May 10 in favor of holding the show Feb. 23 to 28 in Atlantic City. This recommendation was approved and adopted by the general committee.

Joins Chek-Chart

Claude Snider has joined The Chek-Chart Corp. staff as service manager in charge of typography, layout, cover design, and color work. Snider has been with Rand McNally & Co., printers and well-known map makers, for the past five years as assistant art director.

FAST CHARGER

(Continued from page 21)

while the memory of the inconvenience of failure is still fresh in his mind, it can be proved to him that the battery is incapable of taking a full charge. As a rule, it takes little sales talk to persuade him to trade in the defective unit on a new battery.

Before a battery can be sold, it is necessary, of course, to get the owner into the shop for a recharge. The way in which the fast charger does this is surprising. Turner keeps the unit out front whenever the weather permits, and all last winter kept a big banner advertising the charger strung across the front of his shop. He also advertised once a week in a local newspaper. He is convinced, however, that the greater number of recharging jobs came to his shop not primarily because of these promotion efforts but because one satisfied customer told another.

Customers are thoroughly sold on the charger, principally because of the time and money it saves them. There is no need to call back in a day or so to learn the condition of the battery and no service-battery rental to pay. Turner still has two or three service batteries around the shop but he keeps the fact to himself. He uses them only when the location of the car or the garage in which it is housed makes it impossible for the service car to push or tow it.

Elimination of service batteries relieves Turner of the vexations usually associated with them, particularly the necessity of arguing about rental with a customer who lets a week slip by before driving in with the rental unit.

The fast charger is also a time saver for the shop. Turner estimates that taking a battery out of a car, replacing it with a service unit, putting it on the charging line, then placing either the old battery or a new one in the car takes about an hour's labor. Practically all this is saved by the fast charger. There is nothing to do except wheel the charger into position, plug it in, clip the leads on the battery terminals, and take the temperature of the cells once every several minutes. During the 30 min. required to charge the average battery, the battery man can proceed with other jobs. Frequently the battery is charged while the car is being lubricated.

Use of the thermometer, incidentally, effectively overcomes the one objection Turner has heard from customers. An occasional customer, he has learned is afraid the fast charger will injure batteries through overheating. Turner uses the thermometer to quiet that fear. On a battery in good condition, the temperature of a battery being charged ranges between 80 and 90 deg. Fahr. If a cell is de-

fective, the temperature goes higher, often some degrees above 100, but, since a defective cell necessitates replacement of the battery anyway, no harm can be done. Even perfectly sound cells, Turner has discovered, can withstand considerable heat.

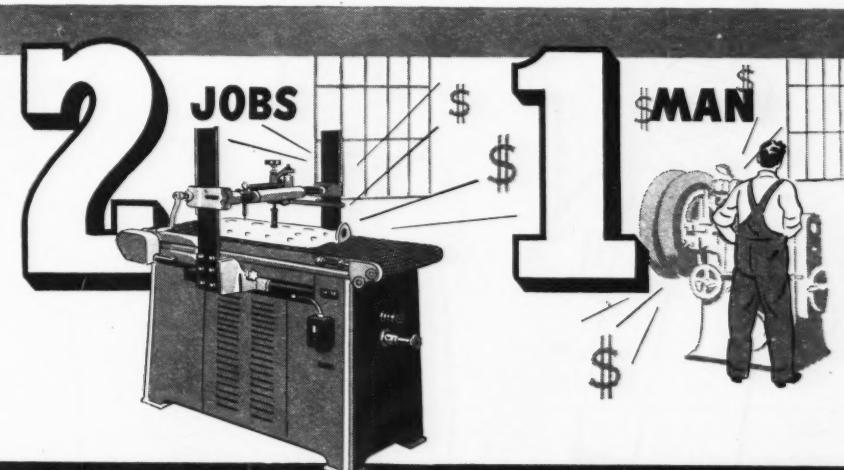
On a busy morning last winter, he clipped the leads to the wrong terminals, and had the bad luck, also, to plug the charger in on a line with a high-capacity fuse, which did not blow out as the regular fuses do under the circumstances. When he next looked at the battery, the temperature had risen to 130 deg. He pulled out the battery, let it cool to 80 deg., and

recharged it. He explained his error to the owner and offered a new battery if the old one failed, but in four months the battery has not come back.

"The service man who doesn't own a fast charger," says Turner, "hasn't really got into the battery business."

Heads New York Branch

Appointment of R. H. Israel, assistant general sales manager of Nash Motors Division of Nash-Kelvinator Corp., Detroit, to manage the Nash Motor Car Co. of New York has been announced today by W. A. Blees, general sales manager.



DOUBLE YOUR EARNINGS WITH THE FULLY AUTOMATIC LEMPCO HEAD RESURFACER

FULLY AUTOMATIC . . . that's the prize advantage and economy of the New, Improved, 1941 Lempco Surfacing Machine.

Any novice can set up, dismount and check the heads in ten minutes. All the rest of the time he's free to do other productive jobs about the shop.

What's more, the Lempco Surfacing Machine will run on ordinary lighting current. Just plug it in your regular socket, and it's ready to go. The new style, silicon carbide abrasive belt is self sharpening. This new 1941 belt remains clean and sharp even on alternate aluminum and iron heads.

With this machine in your shop you can practically double the earning power of any man. Instead of the usual slow, tiresome, dusty, hand-operated method of resurfacing cylinder heads, you just push a button and the hydraulically driven arms of the machine slide the cylinder head back and forth over the abrasive belt. Cylinder head resurfacing is just as essential as cylinder boring or valve grinding. Equip your shop for this service and get a head start on competition for this profitable business.

Please send me price and complete details on your Model SM Cylinder Head Surfacing Machine.

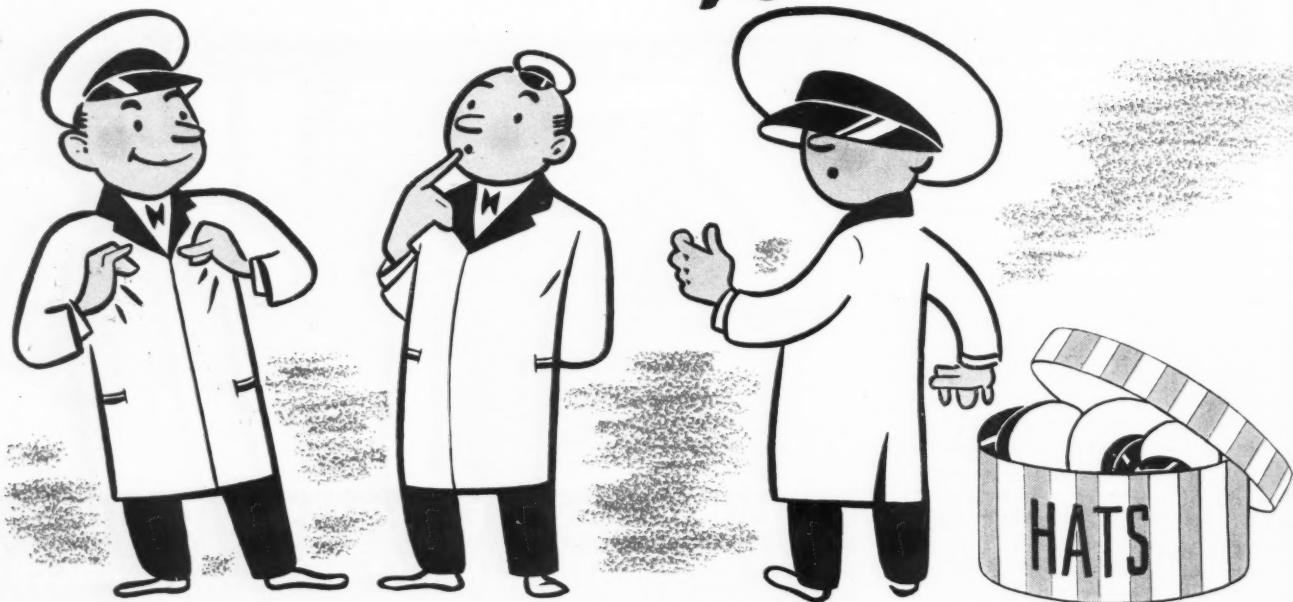
Name _____

Address _____

City _____ State _____

LEMPCO PRODUCTS, Inc.
BEDFORD, OHIO

It fits - when it's a Genuine Ford Part!



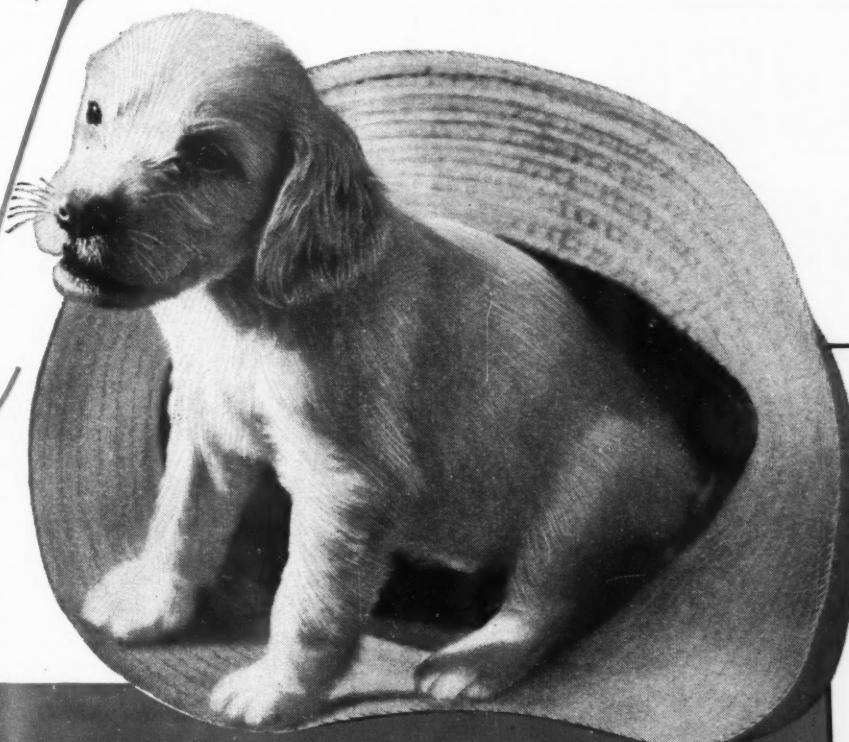
YOU WON'T RISK a bungled job through a misfit part when you use Genuine Ford Parts in replacement work! They fit **RIGHT** the first time. There's no costly reworking — they're **MADE** to fit! Amazing tests guard their quality and precision. In Ford laboratories, parts and materials are analyzed, X-rayed, attacked with twist-

ing, jerking, bending, pounding, rubbing and squeezing machines. Why? To insure a uniform, exact product and to help make Ford motorists **YOUR** steady customers. You'll do well to carry a full stock of Genuine Ford Parts. Call your Ford Parts Distributor for details and discounts — **TODAY!**

Always insist on

Three cartoon men in white coats and hats, pointing towards the right. To their right is a large oval logo for 'GENUINE Ford PARTS'. Below the logo is a dark banner with the text 'FORD MOTOR COMPANY' on the left and 'SERVICE DEPARTMENT DEARBORN, MICHIGAN' on the right, separated by a bracket.

PASTE THIS IN YOUR HAT! MILLIONS OF
PEOPLE WILL SEE THE P.S. FEATURE IN
JUNE 21st COLLIER'S. A LOT OF 'EM
ARE YOUR CUSTOMERS. THEY'LL BE IN
THE MOOD FOR A SUMMER TUNE-UP.
GET THE BUSINESS WITH P.S. TIE-INS!



Collier's
P.S. campaign

How to Make a Hatful of Money!

Remind your customers that you're ready to give them the summer tune-up they read about in Collier's. Do it with P.S. tie-ins . . . and watch the cars come in!

But don't lose any time. Write a post-card that says: "I want to cash in on P.S.—tell me how."

Mail it—TODAY—to Preventive Service, Collier's, 250 Park Avenue, New York City.

Copyright 1941, The Crowell-Collier Publishing Co.

SUPER SERVICE

(Continued from Page 35)

many owners is all you have to do to sell a whale of a lot of fender work.

"We realize price is important in persuading a customer he ought to have this job done or that he needs that piece of merchandise. But we've found, with gasoline, oil, tires, batteries, and so on, that the great bulk of owners prefer a grade that will give the best service, even though it isn't the cheapest. And that's the grade we try to sell.

"On lubrication, we do use price appeal. Our price for chassis lubrication is 75 cents, but we find it's easy to build up the average sale to nearly \$3. The extras come from packing wheels, changing oil, and from the accessory and equipment sales and engine and body service."

To the five rules followed by Early should really be added a sixth—courtesy. It is so closely knit with the other efforts, however, that no one in the shop considers it in any way unusual. Yet the owner of every car, regardless of kind or condition, or whether he is buying five gallons of

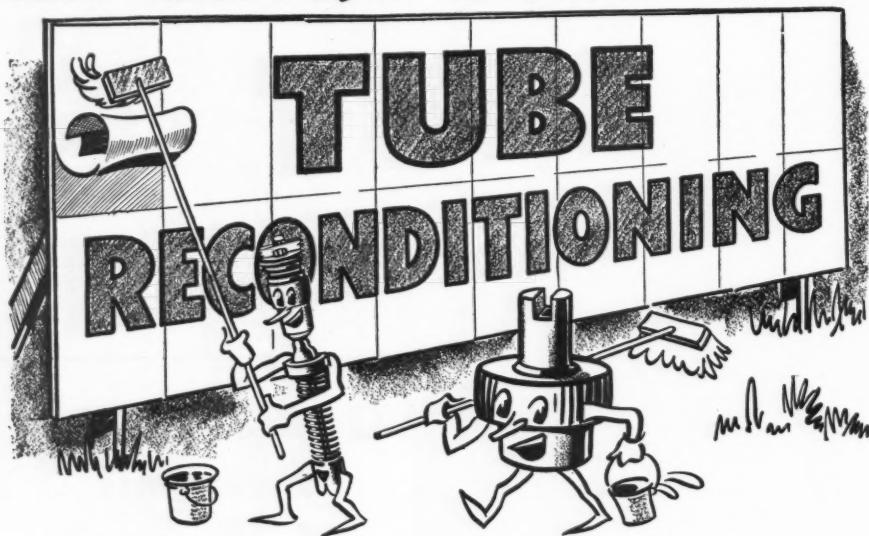
Emblems

The automobile emblems which are illustrated on page 48, but which have the identification blanked out, are as follows:

1. Cole
2. Roosevelt
3. Kissel
4. Flint

gasoline or an engine reconditioning, is treated as courteously as if the life of the shop depended on his patronage. And, in the last analysis, it does. Without friendly treatment, the other appeals would be wasted and the opportunity to do a real super-service job would be lost.

AN EXTRA DIME... IN



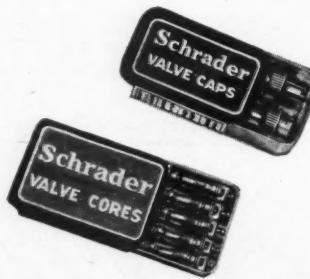
When you repair a tube, always recondition the tire valve by replacing the old valve parts with a new Schrader Core and Cap. Your work is protected against profitless adjustments and you get a dime more for each job.

You charge for new gaskets and spark plugs on motor repair jobs . . . why not charge for new cores and caps on every tube repair job? Use this envelope "Bill Form" to itemize your repair charges. It explains that a new core and cap are part of every repair job that leaves your shop.

Join the many dealers who are using this modern practice. It builds customer confidence in your work.

SALES HELPS

Send for your supply of these free "Bill Forms". They will definitely increase your tube repair profits.



Schrader
REG. U. S. PAT. OFF.
TIRE VALVE
CORES and CAPS

A. SCHRADER'S SON Division of Scovill Manufacturing Company, Incorporated BROOKLYN, N. Y.

Your customers know Schrader Valve Cores and Caps are the best tire valve replacement parts you can give them. It pays to use them always.

Allen V. Potter

Allen V. Potter, 36, sales representative for the Speer Carbon Co., Saint Marys, Pa., covering Detroit and the nearby area during the past five years, died suddenly April 25. His pleasant personality made him many friends. His 10 years in plant development work accounted for his excellent technical background.



"That's the only way he can sleep since he got that garage job!"

NADA Charges Unfairness in Proposed Tax Boost

The proposal to increase federal excise taxes on automobiles from the present 3½ per cent to 20 per cent or more, as recommended to the House Ways and Means Committee by Leon Henderson, Price Control Administrator, and Marriner S. Eccles, chairman of the Federal Reserve System, was opposed by the National Automobile Dealers Association as unfair and discriminatory taxation of an essential and necessary commodity, before the House Ways and Means Committee in Washington, May 15.

President L. C. Cargile, speaking on behalf of the country's automobile dealers, declared that this group were entirely willing to contribute its fair and just share of the defense burden, whatever it may be, but to single out the automobile for a 500 per cent tax increase was grossly discriminatory and unfair to the American public which today relies upon the automobile for low cost, efficient, flexible transportation.

Cargile stated that automobile dealers objected to the dual objective sought in the excessive tax proposal of raising revenue and restricting consumption. He declared that the tax measure should be limited to the prime purpose of raising revenue and that any curtailment or restriction in automobile production should be achieved through direct limitation through the OPM.

Joins Perfect Circle

Duke Golden, an authority in the sales promotion field, has become associated with the Perfect Circle Co. in the Replacement Sales Division. Golden, at the present time, is working on special assignments in connection with marketing Perfect Circle Rings.

Graduated from the University of Texas with a mechanical engineering degree following a year of Army service in France in the World War, Golden later was an instructor in internal combustion engines at the University of Illinois and chief service school instructor for the Oakland Motor Car Co. At Oakland, Golden established the company's national school system for training dealers' service men. He resigned after nine years' service, and in 1938 he entered the film producing industry as

vice-president and technical manager for the Associated Sales Co., Detroit.

Takes Over Permite Line

Robert E. McGill, sales manager of the Replacement Parts Division of Aluminum Industries, Inc., Cincinnati, Ohio, has announced the appointment of Gray Equipment Company, Inc., 210 W. 65th St., New York City, as the warehouse distributor for Permite products. Coincident with this appointment, the company announced the closing of its warehousing branch in that city.

Is your shop BURSTING its BUTTONS?

HALLOWELL
STEEL SHOP EQUIPMENT

Permits quick EXPANSION economically!

PORTABLE STEEL BENCHES

This "HALLOWELL" bench travels with the job . . . saves steps, time, ~~money~~.

Handles like a wheelbarrow . . . but, when placed, stays firm, won't ~~sway~~.

And, like all "HALLOWELL" steel benches, it is **permanently rigid**, with heavy flanged leg construction. Strong steel or laminated wood top defies time and abuse—can't split, splinter or soak up oil. Yet, price invites your order!



Fig. 1112

PORTABLE STEEL TOOL STAND

Keeps tools safely under lock and key . . . with contents always visible! The top provides room to lay out tools, and when fitted with a vise, it's really a compact work-bench. Two casters and handles that swing out of the way make it easy to move this stand right to the job. Investigate this and many other models . . . free bulletin gives details. Write—

STANDARD PRESSED STEEL CO.

JENKINTOWN, PENNA. BOX 561

BRANCHES: BOSTON • DETROIT • INDIANAPOLIS • CHICAGO • ST. LOUIS • SAN FRANCISCO

LOAFING PLUGS ARE
Robbing Your Customers

★ HERE'S THE WAY TO
PROVE IT TO 'EM...
AND SELL MORE PLUGS!



EXPERT

BOWES *Spark*
SEAL FAST *Plug*
Service



Advertising that pulls 'em in
and a PLAN that SELLS for you!

• You'll find it easy to convince your customers that their plugs are robbing them . . . because the Bowes "Seal Fast" Spark Plug Sales Plan identifies you as an EXPERT. The Bowes Direct Advertising Plan works for you . . . the Bowes Distributor shows you how to cash in on your expert ability . . . and your profits go up—Up—UP! Get set NOW to make that EXTRA \$60—\$100 profit each month. Mail the coupon and let the Bowes Man show you how!

MAIL THIS COUPON

MR. BOB BOWES, President
Bowes "Seal Fast" Corporation
Indianapolis, Indiana

Send your man to show me how to cash in on EXPERT Spark Plug Service.

Name.....

Address.....

City..... State.....

P-47

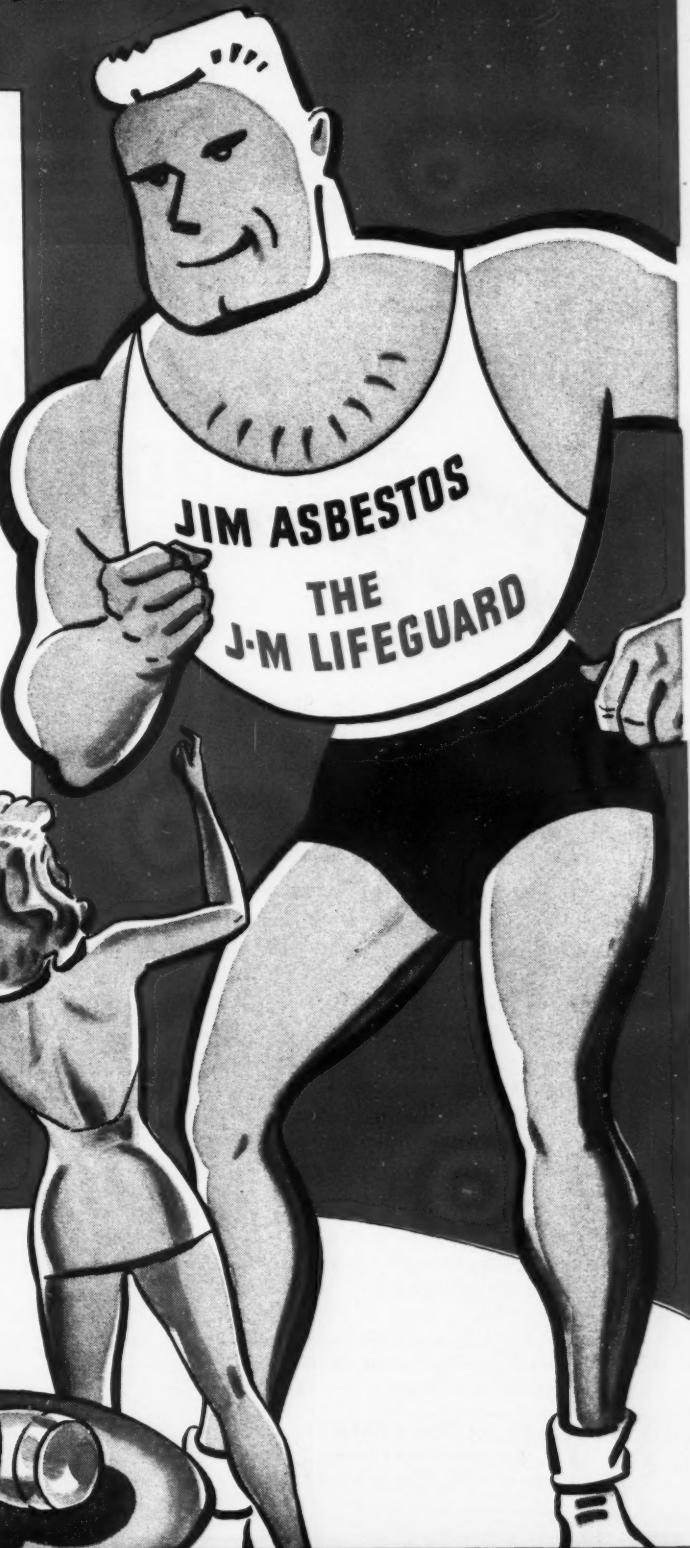
BOWES
SEAL
FAST
SPARK PLUGS



POPULAR with the LADIES

NO wonder Jim Asbestos, the J-M Lifeguard, is making a hit with the ladies! He sums up all the advantages which make Johns-Manville Brake Linings so popular with women drivers. He stands for *highway safety*—quick, sure stops minus the effort of putting man-size pressure on the pedal! He's a favorite with the men, too, because he symbolizes the tough, long-wearing qualities of J-M Brake Linings—results of 35 years of J-M research and experience. So use J-M Linings exclusively . . . your customers will thank you for the *added safety and economical operation* of these superior brake materials.

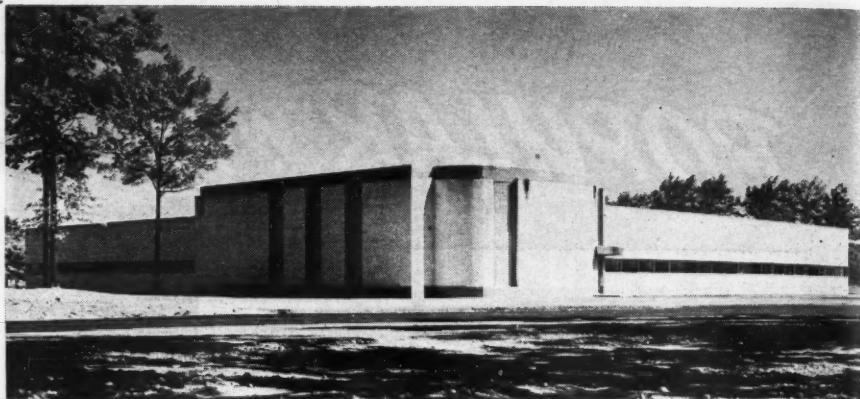
Jim Asbestos will prove to be a real friend to you, too! He will help you tell a more convincing sales story . . . make easier, more profitable sales. If you're not familiar with the money-making advantages of J-M Brake Linings, write us today for the facts. Johns-Manville, 22 E. 40th St., New York, N.Y.



The Lifeguard of the Nation's Highways

JOHNS-MANVILLE BRAKE LINING

New modern plant of the Industrial Tape Corp. at New Brunswick, N. J., which was opened formally May 23, 1941. Quantities of the tape made by the company is now being used in the manufacture of gas masks and parachutes.



No wonder shop men like the STANDARD SET-UP!

FROM every angle, the Standard set-up is a money maker.

The long life peak performance of all Standard products assures customer-satisfaction and good will—the things that build volume.

Standard's powerful battery of Free Dealer Helps gives you every possible aid in sales promotion. Our Free Tune-up Charts and Service Bulletins give you practical information that you need.

Standard's Dealer Co-operation Service brings you our factory trained "Good will men," who re-arrange your stock, put up displays and offer valuable sales suggestions—all FREE.

The Standard set-up is not a one-time proposition—all of these services are continuous!

Put these business-building forces to work in YOUR shop. Write for complete information — Today.

STANDARD MOTOR PRODUCTS, INC.
Main Office and Factory
37-32 Northern Blvd., Long Island City, N. Y.



Industrial Tape Corp. Completes Modern Plant

As the result of improved business, the Industrial Tape Corp., New Brunswick, N. J., announces the completion of a new factory. The new building situated well beyond the environs of New Brunswick is of modern type of construction with air conditioning, fluorescent lighting, sound and heat insulation.

Over 58,000 sq. ft. of floor space is provided for the manufacture of all types of industrial tape, which, from its original application for masking purposes when spray painting, is now used in modern packaging, gas masks, sealing of various types, parachutes and for the protection of surfaces during shipment and installation.

GM Four Months' Sales Show Big Gain Over 1940

April sales of General Motors cars and trucks in the United States and Canada, including export shipments, totaled 255,887 compared with 196,747 in April a year ago. Sales in March were 247,683. Sales for the first four months of 1941 totaled 965,601 compared with 745,929 for the same four months of 1940.

Sales to dealers in the United States totaled 233,735 in April compared with 183,900 in April a year ago. Sales in March were 226,592. Sales for the first four months of 1941 totaled 887,119 compared with 690,349 for the same four months of 1940.

Sales to consumers in the United States totaled 272,853 in April compared with 183,481 in April a year ago. Sales in March were 253,282. Sales for the first four months of 1941 totaled 881,555 compared with 602,789 for the same four months of 1940.

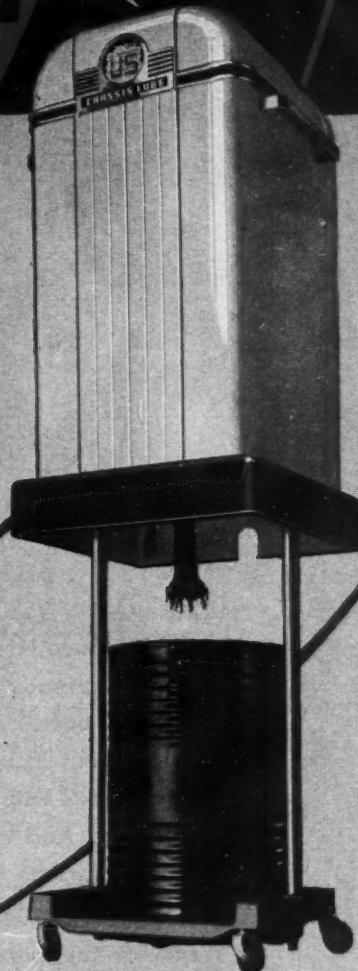
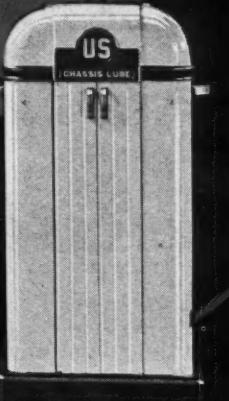
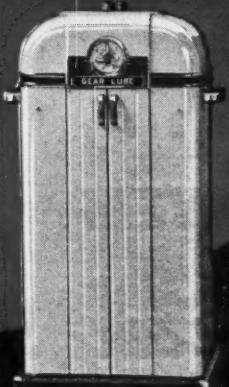
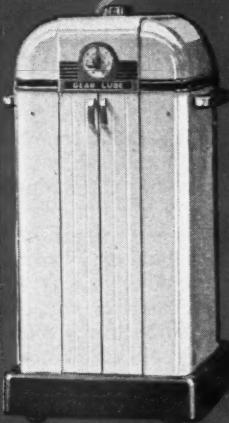
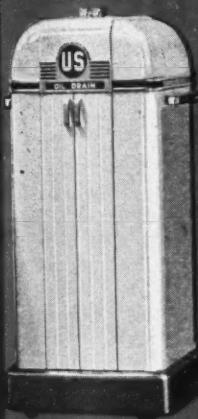
Dividend Declared

The directors of the Perfect Circle Co. declared the regular quarterly dividend of 50 cents a share on the 162,500 shares of outstanding capital stock of the company on May 22. The dividend is payable July 1, 1941, to stock of record at the close of business June 17, 1941.



U.S.
U.S. AIR CLIPPERS

first in modern
operation



The Stratoliner of
Lubrication...up out of the way

The U.S. Portable DeLuxe Air Clippers with their famous patented (Nos. 2,105,990 and 2,105,991) Jack-in-the-box covers are to modern lubrication what stratosliners are to aviation—the line of least resistance with smoother operation, speed and ease in handling, impressive in both appearances and in actions. All DeLuxe Air Clipper units come equipped with the exclusive U. S. Jack-in-the-box cover, which raises the entire cabinet and pump up out of the way by air, allowing attendant to quickly and easily slide out empty grease drum and replace with new one—a flash and the change-over is made.

U. S. Portable DeLuxe Air Clippers with their beautiful white baked enamel cabinets are clean in appearance, in operation and while changing drums. They dress up your station and your profits. With U. S. lubricating equipment on the job your volume and profits always go up to new highs.

Leading Equipment Jobbers handle the leaders in the field . . . U. S. Lifts, Air Compressors and Lube Equipment.

THE
U.S.
AIR COMPRESSOR
COMPANY
CLEVELAND, OHIO

AIR COMPRESSORS * GREASING EQUIPMENT * HYDRAULIC LIFTS

SECRETS OF GENERATOR SERVICE

(Continued from Page 29)

condition like this when the insulated main brush wears out first and no longer rubs on the commutator. When that happens, it's the same as if there wasn't any brush there, all the current that's generated is forced to move along to the third brush and go through the field coils to get to ground. You'll see that I've put little arrows here on the sketch (Fig. 1) to show how the current flows when the insulated main brush isn't on the job.

If either of the other two brushes wear out first, the generator just stops charging altogether and no harm is done. So, fellows, whenever you find burned-up fields, look for an open circuit, either at the insulated main brush, the relay or the car wiring."

"I see how it works out," Ken Stall interrupted, "but, if the field circuit can take only so much of the current when the generator is working right, how is it that on open circuit it can

take a lot more current and burn up?"

"Just a matter of voltage," Sam shot back. "When a generator is charging into a battery, the voltage inside the generator can't go very much higher than the voltage of the battery, because the battery absorbs the current as it's generated and keeps it down around 7 or 7½ volts. But, when the generator has to charge against an open circuit, it's a different mess of kittens. Instead of a pressure of only 7 or 8 volts, the value inside the generator on open circuit often goes up to 30 or 40 volts.

"To demonstrate, I've often connected a 50-watt lamp bulb to a car generator running on open circuit. By speeding up the engine, I could get a pretty fair light out of the 110-volt bulb. So, you see, the voltage goes up inside the generator and the higher voltage crowds more and more current through the field coils. Then this higher voltage in the field makes more lines of force for the armature to cut, the armature current increases, sending still more current to the field—and so on until the fields burn up and ground out, or the armature short circuits.

"Another more or less common trouble encountered by green horns is in making the right connections to the brushes. The reason is they don't know what a generator's all about, and it's about time they did a little boning on the subject. This sketch (Fig. 2) shows the wrong and the right way to connect the brushes in the usual third-brush generator. You'd be surprised how many wrong connections of this kind I've met up with. Because the generator will charge with this wrong connection, many a mechanic concludes he's done a good job, but at the same time he's puzzled as hell as to what makes the thing charge so high.

"The answer to this is easy to see when you have the diagram in front of you. With the main lead connected to the third brush and the field lead connected to the main brush, your old generator really goes on a charging spree. The highest voltage and amperage comes off the commutator at the insulated main brush, and, when this is connected to the field lead in error, a whale of a lot of current is forced through the field circuit. This makes the armature get down to real business, and the result is a very high charge rate that doesn't taper off as the speed increases. Of course, the field can't handle all this current, so the rest moves along and goes out the third brush and to the terminal. On nearly all generators of this type, the main lead and the field lead cross each other in going to their respective brushes. Just remember that and it will help to keep them where they belong."

"That's what I did a couple of weeks ago," Harry Wilkins grinned, "and it turned out to be wrong. Remember?"

"I was coming to that," Sam smiled, "and, if your brain hadn't been cluttered



DEFENSE needs are demanding vast changes—one that is already in evidence is to maintain present used cars in good running condition. You can do your bit towards car conservation by replacing all worn or rough bearings with Ahlberg bearings every time you see the need. And your AHLBERG JOBBER is prepared to supply you with every type and size of Ball, Roller and Thrust Bearings the jobs call for.

Write for the Name and Address of the AHLBERG JOBBER nearest you.



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AGE



"Did you try giving her a swift kick?"

tered up with spring baseball, you would probably have figured it out for yourself—in time. What Harry was up against," Sam explained to the rest of the boys, "was one of those super-duty generators off a highway truck. It's one of the exceptions and I'll draw it on the board for you.

"Here (Fig. 3) I show at A the leads and brushes and the general set-up at the commutator end. Harry, following the usual practice, made his connections as shown at B. You can see how he crossed the leads to get to insulated main and the third brushes. He spent the best part of an hour trying to make it charge and used up a large stock of profanity—which didn't help any. C shows the right connections for this particular job. Now go back and look at B again. The third brush on this job was over close to the grounded main brush and Harry connected one end of the field to the grounded main and the other end of the field to the third brush. This put the two ends of the field circuit just a few commutator bars apart, and in that position they couldn't pick up enough current off the commutator to do any good.

"Go back to C and you'll note that the field leads are now nearly halfway around the commutator from each other, and in that position the field gets plenty of current to do business. When you know a few of these things, you can dope out a job that you never saw before without any trouble. That's why I keep saying that a fellow needs to know the fundamentals to make the grade.

"Here's another one you may meet up with," Sam continued. "In these two diagrams (Fig. 4) I show the difference in internal connections between the standard type generator and a few of the heavy duty jobs.

These are voltage controlled generators but they are also of the third-brush type. The positions of the main brushes are reversed, and it's mighty easy for a fellow who's thinking of a hot date or a cold beer to get his connections mixed up. Just remember that the A terminal of a generator—and that A stands for armature—always goes to the insulated main brush. As I told you before, that's the brush that collects the charge from the commutator and the main idea is to get that load of amperes to the relay and on to the battery as soon as possible and with the least resistance.

"Today we're working with plenty of voltage and current-controlled generators," Sam emphasized, "but we can't do a good job unless we know all about the old third-brush generators. Now here (Fig. 5) is about the easiest-to-understand circuit diagram of a plain third-brush generator I've ever seen. I want each one of you to blueprint it on your mind—and, if you can't do that, you'd better copy it down and wear it inside your hat. Having the circuits well in mind is like knowing your way around town; the stranger can get lost easy in a strange

(Continued on Page 94)

YOUR JOBBER HAS "WHAT IT TAKES"

IN THE AHLBERG All-Bearing LINE

No matter what type of ball, roller or thrust bearing replacements you are called upon to make, your **AHLBERG JOBBER** can supply you with the correct Ahlberg Bearings of tested quality.

Use the specialized and complete bearing service offered by Ahlberg Authorized Wholesalers. It can make your work easier, more profitable and result in extra customer good-will.



Ahlberg Bearing Company

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**FARM
JOURNAL**
AND *Farmer's Wife*

PHILADELPHIA

FREE REPORT on YOUR LOCAL Farm Market

Let us prepare a special report on the counties where you sell. Let us give you the information that will tell you the size of your farm market, show you how to cash in on rural advertising, attract more farm customers. No cost or obligation. Just send this coupon.

FARM JOURNAL, Washington Square, Philadelphia

Analyze my local market for farm sales. Send this special automotive report without cost or obligation. I sell in these counties:

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Out in the country, all around you, farmers—and what a whale of a market they offer you for tires, batteries, pistons, sparkplugs, gasoline and oil, *service!!* Every fifth car and truck on the road belongs to a farm family—more than 1,750,000 tractors.

Over 2½ million of these vehicle-owning families read Farm Journal—America's Largest Rural Magazine. They also operate nearly three million cars and trucks, and drive them a total of 19 BILLION miles a year. Add these figures well over a million tractors and you get Farm Journal's tremendous sales influence in the automotive market. This also explains why rural-area dealers the country over look upon Farm Journal families as their "best customers."

America's leading automotive manufacturers are putting a powerful selling force to work for *you* by advertising their products in Farm Journal.

Cash in *locally* on this national advertising by displaying Farm Journal advertised products where your farm market can see them . . . by featuring these products in your own advertising . . . and by cultivating the rich farm market that exists in *your* area.

If you want to know just how much farm trade there actually is in your territory, mail the coupon below. We'll send you, without cost or obligation, "Special Farm Market Report on Your Sales Area."

MORE THAN

RURAL MAGAZINE

OFFERS YOU NEW FACTS ON YOUR OWN LOCAL FARM MARKET

Allis-Chalmers, Tractors
Auto-Lite, Sparkplugs
J. I. Case, Tractors
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John Deere, Tractors
Dodge, Cars and Trucks
Exide Batteries
Firestone, Tires
Ford, Cars and Trucks
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Fram Oil & Motor Cleaner
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Corp.
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Goodyear, Tires
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Pond Tractor Co.
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**Feature these Farm Journal Products
Your Farm Customers know and like them**

Canton, Ohio, Jobber Relies on Increasing Rural Volume

In recognition of the volume available from rural areas, we have established branches and associate jobbers in six counties. We are of the firm opinion that an increasingly large portion of our volume will come from the rural communities, especially since modern farm methods require power machinery of every description. FARM JOURNAL has wide acceptance in this area, an influential medium in creating greater acceptance for products we handle.

C. L. Stamm, Treas. & Gen. Mgr.,
THE DINE-DEWEES CO.,
Canton, Ohio.

**FARM
JOURNAL**
AND Farmer's Wife

June
1941
5¢



Cover
printed
in four
colors

2 1/2 MILLION CIRCULATION

SECRETS OF GENERATOR SERVICE

(Continued from Page 91)

town but not the local man. He knows where all the streets go.

"And now," Sam finished, "there's just one more thing I want to tell you tonight, and that's about the importance of seating brushes. For years, a good generator man always seated the brushes with a strip of fine sandpaper wound around the commutator, but you don't have to go to that bother today. I've just put in a new supply of brush-seating stones. By using

them, you can save five to ten minutes on every job. You can do the seating on the car or on the test bench, and all you need do is to press the seating stone against the commutator as close as practical to each brush. The end of the stone is ground to fine powder, which will roll under the brushes and grind them to a quick seat. There's nothing in it to hurt the commutator or the brushes, and you can blow out what's left of the powder after the

Announcing... 2 New Time-Savers For the Automotive Service Trade



GASKA-SEAL NO. 1

Spreads easily. Sticks quickly. SETS HARD. Gaska-Seal No. 1 is especially recommended for water connections, push rod covers, oil pan, valve plates, transmission, differential housings, etc.

GASKA-SEAL NO. 2

Spreads easily. Seals tightly but STAYS SOFT AND PLIABLE—easy to remove. Recommended for head gaskets, crank case assemblies, thermostat connections, oil and gas connections, etc.

THESE two latest additions to the growing list of PURITAN AUTOMOTIVE SERVICE MATERIALS are worthy running-mates to PURITAN HYDRAULIC BRAKE FLUID, SHOCK AND KNEE ACTION OIL and other maintenance products. They spread easier, seal quicker and more perfectly than any you have used before. Try a tube of each—Gaska-Seal No. 1 and Gaska-Seal No. 2—today.

Ask your NAPA jobber salesman



PURITAN COMPANY, INC., ROCHESTER, NEW YORK

job is done. I've used this method personally for the last five years and nobody yet has found fault with the way I seat brushes (Fig. 6). I guess that's about . . . Isn't that the phone ringing? Answer it, Splash!"

In a moment Splash came back wearing a broad grin. "It was Mistah Archie Roe talking from over to the hospital," he chuckled. "He say to tell you-all it ain't jest one baby; it's two babies he's got, an' he say to tell you-all tomorrow he's gonna bring down a box of free see-gars for ever'body."

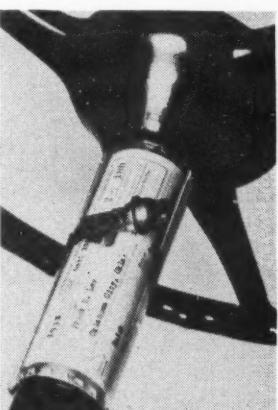
"Let's see," Sam said above a barrage of wisecracks, "in 1939 Archie got married. In 1940 he came along with one boy. In 1941 it's twins, and in 1942 it'll be . . . Oh, what am I talking about, anyway? Come along everybody. If Archie can promote a bunch of free cigars I can, too."

Clark Named to Direct Sales in New England

Arthur J. Clark, vice-president, Edison-Splidorf Corp., West Orange, N. J., a division of Thomas A. Edison, Inc., has announced the appointment of Howard G. Foster as district sales manager of the New England District. Foster will take over the duties of Frank Woodman who has been called to active duty with the U. S. Army and assigned to instruction duty in one of the schools of the armored force. Foster comes to Edison-Splidorf with a substantial background of automotive experience gained with the Timkin Roller Bearing Company.

License Holder

A new license holder that attaches to the steering column and holds the license and the certificate of title has been developed by James Keeshen of the Keeshen Advertising Co., Oklahoma City, Okla. The holder consists of a flexible metal container with celuloid cover, and is wrapped around



the steering column and held in place by a metal strap and seal. A plan is under consideration for cooperation with the various states to adopt a uniform certificate form to replace the usual certificate of title and the registration card, and have each certificate attached to the car it covers.

IT PAYS TO BUY THE BEST

These are the products
which carry NAPA's
"Assurance of Quality"

ALLIED-A P C
Nukrome Valves, Valve Guides,
Pin and Boss Bushings

ALLIED-PRECISION
Piston Pins

ALLIED-RAYMOND
Valve Springs and Keys

ALLIED-WISCONSIN
Pistons, Cylinder Sleeves

AMERICAN BRAKEBLOK
Brake Lining, Clutch Facings,
Fan Belts, Radiator Hose

BALKAMP
Parts for Ford, Chevrolet and Plymouth.
Tie-Rod Ends, Shackles, etc.

BELDEN
Spark Plug Wire and Sets, Primary Wire
and Looms, Battery Cables,
Cordlites and Soldering Irons

BROWN-LIPE
Transmissions and Clutches

BUFFALO—Mufflers and Tail Pipes

CELORON—Timing Gears

DETROIT—Universal Joints

DITTMER—Transmission Gears, Shafts,
and Small Parts

DOUBLE DIAMOND
Drive and Pinion Gears,
Flywheel Gears, Axle Shafts,
Differential Parts

DUCKWORTH—Timing Chains

ECHLIN
Ignition Parts, Coils, Testing Instruments,
Electrical Bushings

FEDERAL—Ball Bearings

GRAPHO
Water Pumps and Parts, Packing

MARTIN-SENOUR
Spraying Lacquers, Synthetic Enamels,
Painter Specialties, Thinners, Reducers

MONMOUTH
Clutch Plates and Parts,
Engine Bearings, King Bolt Sets

NEW BRITAIN—Automotive Hand Tools

PURITAN
Hydraulic Brake Fluid,
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STANDARD
Oil Seals and Grease Retainers,
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TRICO
Windshield Wipers, Fans, Washers,
and other Vacuum-Operated Safety
Products

UNITED
Hydraulic Brake Parts, Brake Cables,
Fuel Pump Parts, Speedometer Cables
and Parts

—AND OTHER PARTS AND MATERIALS

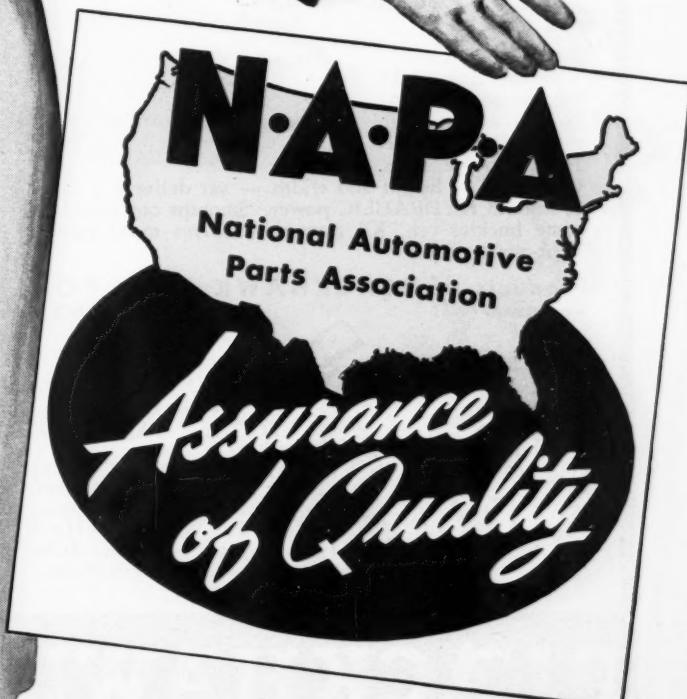
*"That's all
I need to
know"*

● The NAPA Seal—on any automotive product—is all that *anyone* needs to be assured of the product's quality, and the performance it will deliver...

Master stocks of more than 50 non-duplicating lines are maintained in 38 NAPA Warehouses, blanketing the nation. Thus your NAPA jobber can give you quick, convenient service on the finest quality parts for all cars—even on rarely needed numbers.

No waiting for "shipment from the factory." See your NAPA Jobber.

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SHOP-SCOUT

Scoops!

Do You Know?

You can speed up a lot of jobs by using Blackhawk's new Ratchet Adaptors. They click on instantly—to make any regular socket wrench handle into a ratchet. Get in tight spots and at tough angles where regular ratchets never had a chance. Also make tension wrenches easier to use in close quarters. Available in 7/16", 1/2", 3/4" and 1" square dimension.



3/8" Drive $\frac{7}{16}$ " Drive $\frac{1}{2}$ " Drive
Socket—replaces both $\frac{3}{8}$ " and $\frac{1}{2}$ " placed by
7/16" series $\frac{7}{16}$ " series

ordinary drive sets. Thus you make replacements for only one drive, instead of two. Besides, NUGGETS are made of HEXITE steel — outlast all others.

Do You Know?

You can lick pesky box frame dents and kinks in a jiffy—with the No. R-263 Midget Porto-Power Ram. Only $1\frac{1}{8}$ " in height and width — yet delivers 4 tons of smooth HYDRAULIC power. Smooths out troublesome buckles on "X" frames — solves many other tight-quarter jobs.

Products of **BLACKHAWK MFG. CO.**
Department 4651
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**SEE YOUR
JOBBER SALESMAN**

for all the new features in Blackhawk Socket, Box-Type and Open-End Wrenches—Hand Jacks—Service Jacks—and Porto-Power.

BLACKHAWK

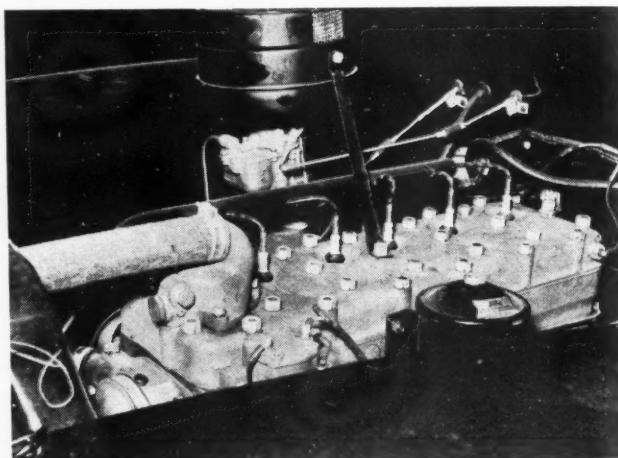
See opposite page for other Blackhawk features

NEW 6 ENGINE BY FORD

Deliveries of new 90 horsepower six cylinder Ford cars, on which the company has been working for many months, are now being made, according to a statement issued May 20 by the Ford Motor Co. Original company plans called for substantial six-cylinder production early this year, but, owing to priorities given to defense work, normal production of six cylinder cars probably will not be in full swing until early fall.

The new Ford six-cylinder engine is to be interchangeable with the ninety horsepower V-8 engine and made available as optional in all De Luxe and Super De Luxe Ford passenger body types as well as commercial cars and trucks.

The "Six" is being brought out, a company official said, as "a running mate to the Ford V-8." All six cylinder units will be priced \$15 below current Ford V-8 prices of corresponding body types.



On the 6 cylinder Ford a new type distributor is driven directly from the front end of the distributor. Note also the position of the ignition coil and the oil filter. The displacement is approximately the same as the present eight.

MECHANICS DO SELLING

A CONTEST among its nine mechanics to see who could sell the most additional work and parts proved a good service sales stimulant for the Public Motor Corp., Houston, Tex. During the term of the contest, the mechanics each received 5 per cent on any labor or material sold in addition to that shown on the original repair order.

To help the men, the company provided printed cards on which each man could check off his name and then slip the card in the car seat. Frequently the owner kept the card and the next time he needed service he either drove in and asked for the man by name or called a particular mechanic by phone.

The appeal to the customer was the same promise of personal service he gets from his physician. It was shown by the contest that the automotive customer likes to make personal contact with the mechanic who has done work on his car, believing that the man who has already worked on it is most likely to know how to handle any new trouble.

For their part, the shop's mechanics enjoyed the privilege of dealing with customers and took personal pride in delivering repair jobs that were entirely satisfactory to customers.

During the contest, rivalry was kept at a high pitch by a bulletin board which showed the standing of the mechanics daily. The company reports that service sales increased 50 per cent during the contest.



"Hey, Bud! I'm Next On That Blackhawk"

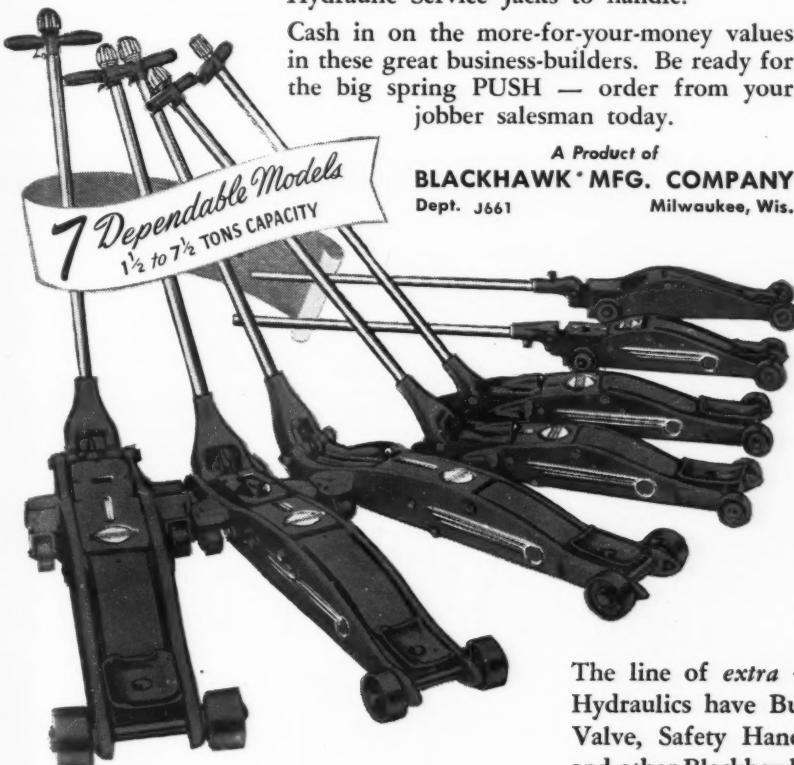
**Mechanics Get Paid for
Working — NOT for Waiting**

Is this going on in your shop? Every time a mechanic has to wait for a jack, some customer has to wait for his car, and that hits you right in the pocketbook.

Keep your men on the job turning out more cars, satisfying more customers, earning more profits — with plenty of service-proved Blackhawk Hydraulics. There's a rugged, fast-working model for every type of job. Ready to swing into action at garages, service stations, repair shops, fleet shops. No car too low, no truck too big for Blackhawk Hydraulic Service Jacks to handle.

Cash in on the more-for-your-money values in these great business-builders. Be ready for the big spring PUSH — order from your jobber salesman today.

A Product of
BLACKHAWK MFG. COMPANY
Dept. J661 Milwaukee, Wis.



The line of *extra values*. Only Blackhawk Hydraulics have Built-in Spotlight, Safety Valve, Safety Handle Lock, Feather-Touch and other Blackhawk time-proved advantages.

BLACKHAWK

See opposite page for other Blackhawk features

SERVICE FOR MODERN HEADLIGHTS

WHEN a modern sealed beam headlight gives 25,000 or more beam candle power, all the mechanic has to do is make sure that the headlight is correctly aimed and send the customer on his way. But, if the headlight tester shows that the sealed beam unit or the older type of bulb is not up to standard, there is work to be done, which in most cases results in plenty of profits for the shop.

When checking headlights, the first step is to check the light output with one of the modern headlight testers. The second step is to check through to find out why the light is not up to standard.

The usual method is to check the voltage at the light terminals after making sure that the connections are in good electrical condition. If the voltage is less than 5.25 volts, it indicates that either the battery is down, that there are some poor connections present, that the wiring itself is too small to carry the load of the lights, or the light or deflector switch contacts are defective. When making this voltage test, the lights should be on the country beam and should burn for five minutes before taking the reading.

Of course, many of the modern cars

are equipped with headlight relays. In such cases, the voltage should be checked at the "output" side of the relay. If the voltage is lower than 5.8 volts, the connections and also the relay contacts must be carefully checked. Naturally the contact points should be clean, without pits and adjusted to the specified gap. Armature air gap must also be in accordance with the manufacturer's standards.

On the older type of headlights, it is also necessary to polish the reflectors and in some cases they must be replaced or replated. Of course, care must be exercised when assembling these lights to make sure that the headlight lens is not cracked or chipped. In addition, if the condition of the polished reflector is to be maintained, a new headlight lens gasket must be used.

Without a modern headlight tester, or light output meter, it is virtually impossible to make an accurate check of the headlights. However, if none is available, the familiar screen is used and the bulbs are checked for blackening by placing them in a white porcelain tray or a special bulb tester. In addition, it is also necessary to make the voltage tests as previously explained.

The proper use of a headlight tester, followed by a check of the voltage at the bulbs, will also indicate the possibility of the headlight bulb burning out prematurely. In other words, if the meter indicates greater than normal brilliancy of the bulb and the follow-up check with the voltmeter indicates excessive voltage at the bulb contacts, it's a safe guess that the life of the bulb will be short. In such instances, the operation of the current and voltage regulator should be checked. Or, if the generator is of the third-brush type, check for a high resistance or bad contact between the generator and the battery ground.

Named Test Coordinator

The appointment of Charles B. Kass as coordinator of performance and endurance tests on the road for the Ethyl Gasoline Corp., has been announced by Earl Bartholomew, director of the company's engineering research laboratories. Kass will be in charge of endurance and performance tests at Detroit, and will coordinate similar tests made at Ethyl's laboratories at San Bernardino, Calif., and other points.

"It all adds up to



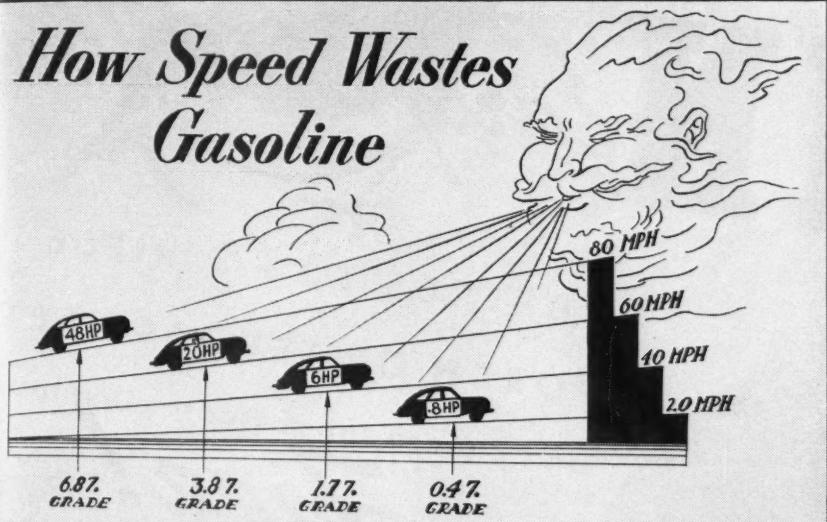
SUPERIOR PRODUCT

You can't beat nationally-known Grey-Rock Balanced Braksets for quick, quiet, smooth stops and long wear.



TOP-NOTCH TECHNICAL HELP
There's nothing so complete as this new Grey-Rock 48-page Chart with National Safety Council's New Brake Servicing Schedule added.

How Speed Wastes Gasoline



This chart, compiled by Plymouth experts from data recently obtained in recent mileage efficiency tests, reveals how power and fuel are lost in overcoming wind resistance as the speed of the car increases. At 80 m.p.h., wind resistance uses 48 horsepower, equivalent to climbing a grade of 48 per cent.

Stromberg Field Schools Are Attended by 5,000

During the past few months, more than 5000 service men, car dealers and distributors have attended the 1941 Stromberg field schools sponsored by

the Bendix Products Division of Bendix Aviation Corp. In all, nearly 400 separate sessions have already been held in cities throughout the country.

The company states that these figures, as compared with 1940, represent a large increase in attendance

and in the number of schools held. Bendix has conducted two types of Stromberg schools this year. To date, 250 of the 400 schools have been devoted to carburetor service on certain makes of cars. The other school sessions covered Stromberg carburetor service in general.

Sales Force Shifted

Assignments of new men to three western sales territories are currently announced by Charles R. Crowder, sales manager of the Automotive Division of the Van Norman Machine Tool Co., Springfield, Mass. Under these assignments, A. L. Davidson goes into the Pacific Northwest territory. R. C. Holroyd will cover northern California, Oregon, Nevada and Utah, and A. D. Catterlin has started in with E. A. ("Slim") Carmichael in southern California and Arizona.

Gets Right To Product

Patent licenses to manufacture and sell Zoop, self-emulsifying degreasing solvent concentrate formerly owned by the Johns-Manville Automotive Division, have been acquired by Bennett, Inc., Cambridge, Mass. A new improved product is being produced and is now available to former Zoop customers and others as well as the wholesale jobber.

this!

BETTER SERVICE-SELLING PLAN
Grey-Rock alone offers you this complete, confidence-inspiring plan whereby your customers get your personal guarantee of work done to N. S. C. standards.

BANG-UP ADVERTISING
The best advertised line in the industry with a season-long campaign to the 50,000,000 audience of SAT. EVE. POST, COLLIER'S, LIFE and TIME.

BIGGER BUSINESS
BETTER BUSINESS
REPEAT BUSINESS
G-R-E-A-T-E-R P-R-O-F-I-T-S

Grey-Rock

BALANCED BRAKSETS

UNITED STATES ASBESTOS DIVISION
of Raybestos-Manhattan, Inc., MANHEIM, PA.
BRAKE LININGS • CLUTCH FACINGS • FANBELTS
AUTOMOTIVE HOSE • RELINING EQUIPMENT

ARVIN



BRINGS YOU 3-PIECE
PORCH OR TERRACE SET

and 7-piece set of Heater Displays

Free!



ARVIN HEATER line-up for '41

INCLUDES ALL THIS: (1) An entirely new Underseat Heater 83G, shown above, list \$16.95. More efficient—easier to install. (2) New Defroster-Foot-Warmer 43G. Installs in series with Underseat Heater and fan-forces a strong blast of heated air to both sides of windshield. List \$10.90, with defroster fittings. (3) Special package combination for Ford 90G, Chrysler-built cars 91G and General Motors 92G, containing Underseat Heater 83G, Defroster-Foot-Warmer 43G, and defroster fittings for complete, tailor-fit installations. Easy to sell—easy to order—easy to install. List \$25.95. (4) Famous Arvin 72G Special Dash Model with tailored engine fittings and special fast-warm-up equipment for Ford, Chevrolet and Chrysler-built cars. List \$15.95 to \$17.95. (5) Two universal dash models that list as low as \$9.95. See an Arvin jobber for full information.

NOBLITT-SPARKS INDUSTRIES, Inc., Columbus, Indiana



ARVIN



HOT WATER
Car Heaters
DASH AND
UNDERSEAT MODELS

\$9.95

With an order for 12 Arvin Heaters and 6 defrosters for shipment to you before August 31, you get all this *Free!*

A 3-piece set of Arvin All-Metal Furniture shown above—*free!*

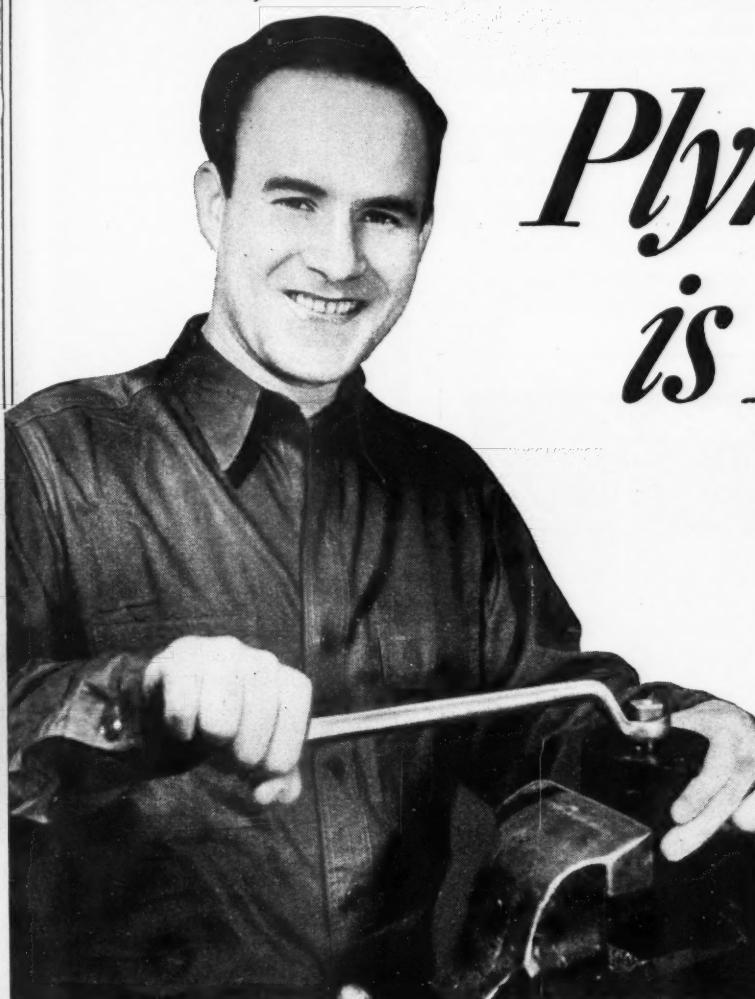
A 7-piece set of Arvin Heater sales building displays, shown in miniature here.

All *Free* with the Arvin Early Bird Deal. Ask your jobber about it!



There are more and better dealer displays in the Arvin line-up this year. Complete Kit 12G which goes to Early Bird Dealers *Free*, contains 7 big pieces. The beautiful new floor display has a life-size girl standing beside the wood-braced easel which supports the actual heater. It's a real attention getter—shown in miniature at left. In addition, there's a large wall or window poster, 4' by 3'—two counter cards—and three other posters for your window or walls. All beautifully lithographed in striking colors. All keyed into Arvin's big national consumer advertising program this year.

"Folks, I've worked on 'em all—it's a Fact



Plymouth is Finest!"

Independent Garage Men
of Nation Vote:

**PLYMOUTH IS BEST-
ENGINEERED OF
"ALL THREE"**

In Nation-wide Poll, Plymouth Wins
More Votes than Either
of the "Other 2" Low-Priced Cars!

**HOW INDEPENDENT
GARAGE MEN VOTED**

PLYMOUTH—44.5%

CAR "2"—40.3%

CAR "3"—15.2%

OF "ALL 3" low-priced cars, Plymouth is best-engineered—and it's the independent garage mechanics of America who say so!

You enjoy the extra room and riding smoothness of Plymouth's big 117-inch wheelbase—longest of "All 3" low-priced cars! And only Plymouth of "All 3" gives you the protection of new Safety Rim Wheels...designed to keep

a flat tire from rolling off the wheel in case of a blowout or puncture.

And, with the greatest power per pound of weight of "All 3," Plymouth gives you the finest performance. You do less gear-shifting! *Prices subject to change without notice.* Plymouth Division of Chrysler Corporation.

HEAR MAJOR BOWES, C.B.S., THURS., 9-10 P.M., E.D.S.T.
SEE THE NEW PLYMOUTH COMMERCIAL CARS

**ENJOY THIS FINER QUALITY IN
CHRYSLER CORPORATION'S NO. 1 CAR!**

Longest Wheelbase of "All 3"

Widest Rear Seat of "All 3"

Greatest Power Per Pound of "All 3"

Biggest Safety Advance of "All 3"

Widest Color Choice of "All 3"

Most High-Priced Car Features of "All 3"

Lowest Prices of "All 3" on Many Models



Riley Appointed Manager of Overseas Operations

Edward Riley has been named general manager of General Motors Overseas Operations. Alfred P. Sloan, Jr., chairman of the corporation, has announced. Riley, who since July, 1940, has served as acting general manager, succeeded Graeme K. Howard. Howard now is vice-president in charge of Overseas Operations. Riley's office is in New York.

Charles B. Stiffler has been appointed general assistant comptroller of the corporation. He has been with

General Motors since 1919. In 1938 he became United Motors general manager. Stiffler will be succeeded as general manager of United Motors Service by Walter N. Potter, who has been vice-president and general sales manager of the United Motors division since 1938.

Wallace G. Kileen has been appointed assistant comptroller of the corporation in charge of the cost accounting section.

J. A. Sarason has been appointed assistant comptroller of the corporation in charge of central office general accounting section.



Carl J. Andrae

Wilkening Appoints Andrae Assistant Sales Manager

Announcement is made by the Wilkening Manufacturing Co. of Philadelphia, maker of Pedrick piston rings, of the appointment of Carl J. Andrae as assistant sales manager of the company's Replacement Division.

Andrae is widely known among automotive jobbers, having been connected with the Perfect Circle Co. for a number of years as district manager, and for the past three years with the Hastings Manufacturing Co. as regional manager.

25,000 Mechanics Quizzed on Year's Training Program

During May, more than 25,000 Chevrolet service men from the division's 8500 dealerships reviewed a year's training program in their regular yearly examination, held in each zone throughout the country. Each mechanic answered a 50-part quiz, those passing winning the Approved Mechanic rating.

The quiz summarizes an entire year's work, according to Ed Hedner, national director of service for Chevrolet. Monthly schools are held in each dealership to keep mechanics abreast of latest developments in the service field. The annual review sessions affords the mechanics an opportunity to win an approved mechanic's diploma for a new year.

Electric Group to Meet

Members of the Manufacturing and Distribution Divisions of the Automotive Electric Association will hold their annual fall meeting, Sept. 28 to Oct. 1, inclusive, at the Edgewater Gulf Hotel, Edgewater Park, Miss., midway between Biloxi and Gulfport. R. J. Montgomery of Packard Electric Division is chairman of the convention committee.



UP TO 40c MORE PROFIT FROM EACH REPAIR DOLLAR!

1 HYPPRESSURE JENNY increases your net profit on repair jobs by saving 25% to 40% on labor costs! Steam cleaning before repairs saves the 15 to 25 minutes out of every man-hour which is usually spent in wiping grease and dirt from machine parts, tools, hands, etc. That's extra profit for you!

\$15 TO \$50 MORE FOR USED CARS!

When used cars are steam cleaned with HYPPRESSURE JENNY to new car appearance, they move faster and bring from \$15 to \$50 more.

EXTRA-PROFIT JOBS WITH WASHES AND LUBES!

HYPPRESSURE JENNY cleans motors and chassis spic-and-span. Sell these new-profit services with washes and lubes! For example, Jenny cleans a motor in 10 to 15 minutes—job sells for \$1.50 to \$3.00!

Investigate this 3-fold profit opportunity now. Fill in and send the coupon for a free survey today.

HOMESTEAD VALVE MFG. CO.
P. O. BOX 95 CORAOPOLIS, PA.

SEND FOR THIS
FREE SURVEY
TODAY!



O. K.—Send that Survey.

We recondition, repaint, repair.....cars or trucks monthly.

We employ.....mechanics on dirty, greasy repair work.

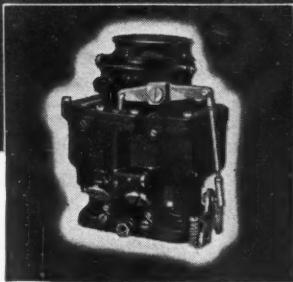
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ADDRESS.....

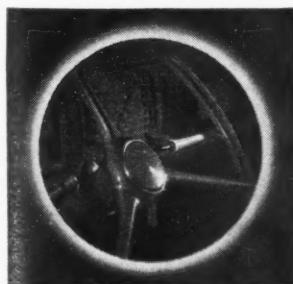
This very day . . . and every day, research, development and testing are creating

New and better BENDIX Products

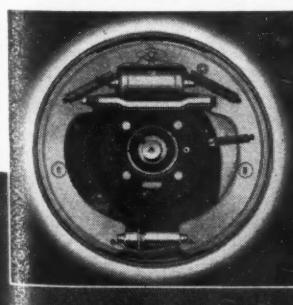
for the great new years to come!



Stromberg Carburetor
Pioneer of progress in carburetion—outstanding for its high efficiency, its many superiorities, its long life, its simple and sturdy construction and its stability of adjustment.



Bendix Gear Control
Pioneer of finger-tip gear shifts and most highly developed of steering post gear controls—least manual effort needed—utmost responsiveness provided. Years of service.



Bendix Brakes
Smoothest, simplest, most stable in adjustment, easiest to adjust. Embodying exclusive principles which assure better braking with less pedal effort and lower maintenance expense.

PACING the tremendous expansion of Bendix plants and personnel and machinery, an unceasing program of research and development goes on in Bendix engineering laboratories.

Carburetion, brakes, power braking, vacuum and hydraulic and electrically actuated remote-control systems, gearshifting and clutch control applications, universal joints—all of these vital phases of automotive engineering are being notably and uninterruptedly advanced by Bendix development work.

Thus while the heavy program of America's Defense needs goes forward with all energy, and while the present urgent needs of commercial automotive activity are being served to the best of our ability, the future of the automotive industry is constantly, vividly, in mind. In the Bendix laboratories, as in your own plants and shops and service establishments, there are no priorities on creative thinking . . . on planning . . . on making ready for your cars and trucks and buses of tomorrow.

When that day comes—when you are ready—Call Bendix.

BENDIX PRODUCTS DIVISION
of Bendix Aviation Corporation, South Bend, Indiana
In Canada: Bendix-Eclipse of Canada, Ltd., Windsor, Ont.

**BENDIX PRODUCTS HAVE BEEN MADE PART AND
PARCEL OF MORE THAN 80 MILLION CARS**

Mouse Has Leading Role In Perfect Circle Campaign

How the lowly mouse has been built up rapidly to a position of no little esteem in advertising and merchandising circles was revealed by George W. Stout, advertising manager of The Perfect Circle Co. The revelation came as Stout outlined the steps which have been taken to promote the company's new advertising theme for Perfect Circle Triple Action piston rings.

Current Perfect Circle advertising features illustrations of a mouse and his various experiences with a mouse

trap . . . the headline of each advertisement reading, "One Spring's Enough!" Interesting, too, is the unique hand-lettered headline in characteristic spring steel color and shape. Introductory copy explains that "if pistons could talk, they, too, would say, 'One Spring's Enough!'" In each advertisement appears a small panel that shows the three types of piston rings used in most Perfect Circle Triple Action piston ring sets, with an arrow indicating the single expander spring employed in these sets and with appropriate copy repeating the theme, "One Spring's Enough If It's Triple Action."



"He's driving one of the Army's new camouflaged trucks and I can't find the gas tank!"

THE GIFTS ARE ON US!

WIN AWARDS—AND PROFITS—with

VALVOLINE



We're celebrating the first Diamond Jubilee in oil lubricating history. We want you to *sell-ebrate* with us!

Valvoline dealers everywhere are not only having their biggest year in premium oil business, in goodwill, in profits—they're winning swell awards too! Radios, watches, golf clubs, silverware: take your

pick from the big Valvoline Diamond Jubilee Prize Book. Use our daring sales plan, our dramatic *Good-As-Gold Guarantee*, and **SELL TO WIN!**

Tie in with the First of the Pennsylvania Oils. It's Valvoline's year it's *your* opportunity. Write or wire for details!

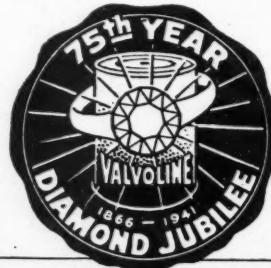
VALVOLINE OIL COMPANY

540 East 5th Street, Cincinnati, Ohio

New York — Chicago — Atlanta — Los Angeles
Refinery in Pennsylvania

COSTS MORE TO MAKE

—COSTS LESS TO USE



Johnson Is Elected To Borg-Warner Board

The stockholders of Borg-Warner Corp. at their annual meeting, April 25, reelected all former directors and named John E. Johnson, of Muncie, Ind., to the board to succeed the late John Fletcher. The stockholders also approved the adoption of a retirement annuity plan. All officers of the corporation were reelected by the board of directors.

Chrysler has WHAT SMART OPERATORS WANT!

COMPLETE
MARKET COVERAGE

... Lowest-priced to
highest-priced!

RAPID GROWTH
IN DEMAND

... fastest growing
sales in industry!

ENGINEERING FEATURES
THAT STIMULATE DEMAND

FLUID DRIVE

HYDRAULIC BRAKES

FLOATING POWER

ALL-STEEL BODIES

CONTINUOUS
PROGRESS

... a growing oppor-
tunity year after year!

REAL COOPERATION

*The unusual and active
assistance of a sales
staff of long and
broad experience!*

★ **Write!**

Find out whether or not a franchise is
available in your locality. Address
Chrysler Corporation, Chrysler Sales Divi-
sion, 12200 East Jefferson Ave., Detroit.

CHRYSLER and PLYMOUTH

GM Institute Expands to Meet Defense Needs

A new building expansion program is announced by General Motors Institute, keystone of the huge General Motors defense training program.

Work is scheduled to get under way immediately on a three-story extension of the institute plant. The new wing will add an acre of space for classrooms, shops and other facilities. Completion is set for the beginning of the new term next fall when a further large jump in enrollment is foreseen as a certainty.

Albert Sobey, director of the insti-

tute, reported a 40 per cent increase in man-hours of training within the past year. He said the trend was still sharply upward and that General Motors manufacturing divisions were finding institute trained men, such as those trained in the cooperative program, of such value that they were greatly increasing next year's enrollments for worker-student training.

J. L. McKnight

J. L. McKnight, assistant secretary of the B. F. Goodrich Co. and head of the firm's legal department,

died in his sleep Thursday, May 15, at his home in Hudson, Ohio, near Akron.

He had appeared in the best of health when he left his offices Wednesday, complaining of no indisposition, associates said. Death was attributed to heart trouble.

McKnight was 55. He was born in Mt. Lebanon, Pa., the family home where his mother, Mrs. Liza McKnight, still lives.

He was well known in Akron and had been connected with Goodrich since 1918.

Zone Chiefs Shifted

Promotions and transfers affecting four zones have been announced by D. E. Ralston, Oldsmobile's general sales manager.

James Berry, Oldsmobile's zone manager in Cincinnati since 1935, has been transferred to Detroit. Berry was assistant zone manager in Detroit from 1933 to 1935. He will be succeeded in Cincinnati by Russell Lesher, zone manager for Oldsmobile in Minneapolis for the past 2½ years.

L. H. Brown, Oldsmobile zone manager in the Oklahoma City zone since 1934, has been transferred to a similar post in Minneapolis, succeeding Lesher.

A. J. Mutschler, assistant zone manager in Minneapolis for the past 2½ years, has been promoted to the office of zone manager for Oldsmobile in Oklahoma City.

All-Rubber Lamp

The Do-Ray Lamp Co., 1458 South Michigan Ave., Chicago, Ill., announces a new type all-rubber three-jewel lamp available for three different mountings. It can be used for clearance, as a marker, or for park-



WHEN I was a boy I can well remember going down to the general store on Saturday with my weekly nickel, and nine times out of ten I would come back with a PRIZE package of pop corn.

Boy, how that PRIZE intrigued me.

It didn't matter much whether or not the pop corn was any good. What I wanted most of all was to see what kind of wonderful gadget was sealed up in that pretty box. But that's when I was a boy.

Perhaps I am more cynical now, and perhaps I don't get as much kick out of what I buy with my weekly nickel.

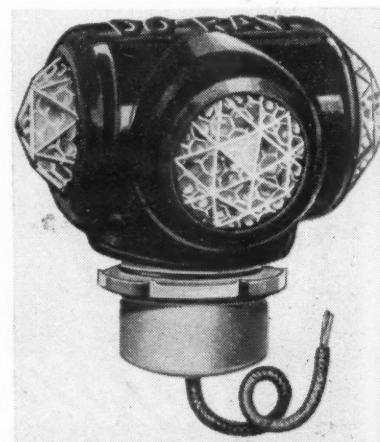
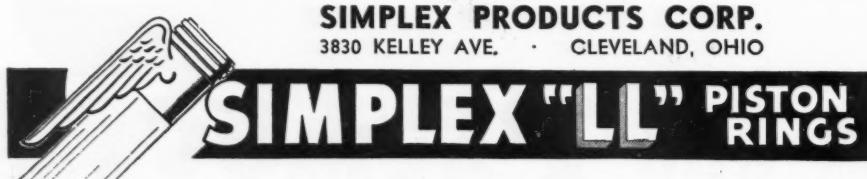
But one thing is certain. I do get more for my nickel now. I now make sure I get the most and the best pop corn for my nickel. For I have long since found out that you don't get something for nothing and you usually pay for what you get.

It does seem rather silly for full-grown, "of-age" piston ring manufacturers to try to sell their piston rings by giving away baby spoons, nipples, diapers, or what have you, if you will only buy a set of their piston rings.

I feel pretty sure the average automobile repair man has "grown up" too, and that he is more interested in really fixing his customers' automobiles and making some real money for himself, than he is in winning some kind of a cheap prize, or paying two or three prices for some kind of fancy gadget.

"*Simplex Sim*"

SIMPLEX PRODUCTS CORP.
3830 KELLEY AVE. CLEVELAND, OHIO



ing. It is waterproof, dust-proof and vibration-proof, according to the manufacturer. The lenses are interchangeable, which allows for mounting on either side of the vehicle. This new lamp is furnished with a heavy metal guard protection, or with a heavy metal angle bracket. It can also be used as a fender lamp.

PUT THIS SALESMAN TO WORK NOW!



Watch your Battery Selector send sales up!

The Gould Battery Selector is designed for SALES—and it makes 'em. The sales increase enjoyed by Gould dealers is a fact you can use to calculate your own profit possibilities. Better still, this sales increase really means profits because it all comes in the bigger, better types, the batteries priced high enough to make you real money on every sale.

The Gould Selector is just one part of the complete sales promotional plan offered to Gould dealers this year—a plan that includes the quick, easy, modern way to find the battery that needs replacing. It's all explained in the GOULD GUIDE TO GREATER PROFITS. Send coupon

for this valuable book today. Gould Storage Battery Corp. Factories at St. Paul, Depew, N. Y., North Bergen, N. J., Leavenworth, Kans., Atlanta, Chicago, Dallas, Los Angeles.

GET THIS FREE BOOK

Gould Storage Battery Corp., F43, St. Paul, Minn.
Send at once free booklet GOULD GUIDE TO GREATER PROFITS.

Name.....

Address.....

City..... State.....



GOULD

THE BATTERY PICKED BY ENGINEERS



ADVERTISED TO
YOUR CUSTOMERS
IN THE
SATURDAY
EVENING POST

Officers and Directors

Re-elected by Perfect Circle

All directors of The Perfect Circle Co. were reelected for the year 1941 at the annual stockholders meeting held at Hagerstown, Ind., April 21. At a meeting of the directors on April 23, all officers were reelected for another year.

Officers for 1941 are Lothair Teetor, president and general manager, Ralph R. Teetor, vice-president, Leslie B. Davis, secretary-treasurer, and C. Ray Teetor, assistant secretary-treasurer and comptroller.

Directors reelected are Lothair Teetor, Ralph R. Teetor, Dan C. Teetor, Don H. Teetor, W. Blair Hartley, Macy O. Teetor, Herman Teetor, George H. Keagy, and Wallace M. Harkrader.

Frank H. Sparks Named President of College

The board of trustees of Wabash College, 109 year old liberal arts college for men, has announced the appointment of Frank Hugh Sparks, one-time manufacturer of automobile accessories, as president. Sparks left

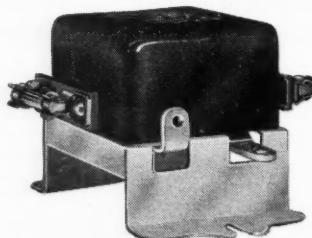


Don't Turn Away TRACTOR JOBS

Use The Super Chief Magneto for tractor replacements. Simple, rugged, easy to install. Made in 1, 2, 3, 4 and 6-cylinder models and backed by a guarantee.

P. & D. coils, condensers and contacts are scientifically designed for peak performance in modern cars. Experts know that they make motors run sweeter.

America's Best Mechanics put EXTRA ZIP in TUNE-UP JOBS with P. & D. IGNITION PARTS



Ask your jobber or write direct for particulars

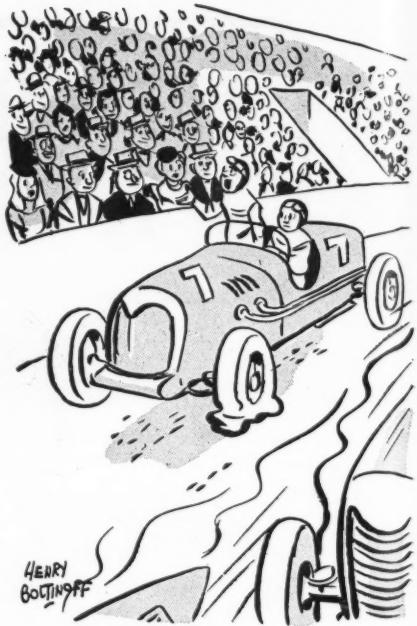
P. & D. MANUFACTURING COMPANY, Inc.

STARTING
LIGHTING
IGNITION

LONG ISLAND CITY
NEW YORK

REPLACEMENT PARTS

P. & D. Manufactures ONE complete quality line. Only the finest materials and workmanship obtainable are employed.
YOU CAN NOT PURCHASE ANY FINER QUALITY



"Anybody here want to earn two bits in a hurry?"

a brilliant career in business in 1935 to prepare himself for work in education and he has spent the last six years in advanced study and as a lecturer in economics at the University of Southern California.

Sparks was born Jan. 11, 1891, on a farm in Grant County, Ind. After being graduated from Culver High School in 1910 he went to Indianapolis where he was employed by the old Carl G. Fisher Automobile Co. There he met Quentin G. Noblitt, then an automobile mechanic, whose helper he became.

In 1919 Sparks and Noblitt organized the Indianapolis Pump and Tube Co. and in 1927 incorporated their organization as the Noblitt-Sparks Industries and began to specialize in the manufacture of automobile heaters, radios, and other accessories.

Toledo Reports First Quarter Sales Show 38 Per Cent Boost

Toledo Steel Products Co. announces that its replacement sales for the first quarter of the present year were 38 per cent ahead of the corresponding period in 1940. These sales do not include defense material of any kind.

March sales, the report indicates, was the biggest in the company's history. Business for 1940 showed an increase of 26 per cent over 1939.

Signs Radio Contract

Philco Corp. has signed a contract with The Studebaker Corp. to supply the latter company's automobile radio requirements for its 1942 cars, it is announced by Russell L. Heberling, vice-president.

THRIFTY

ON TIME!
ON LABOR!

PREP-SOL

► For speedier, easier preparation of old surfaces for repainting, Prep-Sol is a safe, sure cleaner! It quickly removes chalked pigment, grease, wax, oil, prior to the sanding operation. Get Prep-Sol for your next job. It makes possible uniformly finer results! E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Refinish Sales, Wilmington, Delaware.



Goodrich Triples Output of Synthetic Rubber Factory

John L. Collyer, president of the B. F. Goodrich Co., recently announced that production of the firm's synthetic rubber, Ameripol, is being stepped up from six to 18 tons a day. With defense requirements boosting consumption of crude rubber to the highest level in history, facilities at the company's Akron synthetic rubber factory, the first of its kind in the nation, are currently being enlarged to bring about the increase.

Marking the second major step voluntarily taken by the company "to

help provide this country with synthetic rubber production that can be as vital to national defense as battleships and airplanes," the increase was announced by Collyer in an interview with Watson Davis, editor of *Science Service*, over the Columbia Broadcasting System.

Annual Sales Meeting Held by Cincinnati Balcrank

Seventy enthusiastic district and division managers from all parts of the United States attended Cincinnati Balcrank's annual sales meeting the week of April 7.

The first day's program, opened by a welcoming address by Cincinnati's Mayor Stewart, continued with a dramatized presentation of the new "Velvetizers." Three bigger and more beautiful lines of lube equipment were introduced in addition to several entirely new items—super de luxe work bench, super de luxe oil bar, super de luxe hose reel, super de luxe desk.

Prominent speakers on the program included Clarence M. Doiseau, president, and Richard P. Field, sales manager of Balcrank; Paul S. Perry, president, and Ted Brown, vice-president, of Perry-Brown, Inc., advertising agency. Brown is the Balcrank account executive.

Prizes totaling \$2,500 were presented at the "Victory Dinner" to the salesmen who scored the highest number of points in a recent sales campaign.

Wile Factory Manager

Daniel D. Wile has been appointed new general factory manager of the Kellogg Division of the American Brake Shoe and Foundry Co. at Rochester, N. Y. Announcement of the appointment of Wile, founder of the Savage Arms Co., was made by J. F. Weller, President of the Kellogg Division, manufacturers of Kellogg-American air compressors, automobile lifts, car washers and paint spraying equipment.

Venetian Blinds for Rear Windows

The streamlined rear body panel design has presented difficulties in the use of a rear window shade to protect the rear seat occupants from the strong rays of the sun, as well as to protect the driver from reflections from the headlights of the car in back. This difficulty has been overcome by the Knight-Morley Corp., 2790 24th St., Detroit, Mich., by the introduction of venetian blinds for the rear window. Held in place by spring ten-



Call for MORE MONEY!



Maybe you've never made a cleanup on the stock market. Or got in on a gusher or gold mine. Maybe you've never ridden the tail of a comet, either. But put 'em all together for an idea of what it's like to be on the Pennzoil direct line to profits.

Top quality that never varies gets customers, and we mean *gets* 'em. Besides that, you can pick completely worked out methods for boosting any or all parts of your business, whether they have anything to do with lubrication or not.

When you put in a call for more money, get the direct line. Dial "Z"!



HEY, MAILMAN! Take this to The Pennzoil Co., Oil City, Pa., and tell 'em I want honest-to-Andy dope on how to:

- Bring inactive customers back
- Stop complaints on quality
- Get customers in oftener
- Sell 'em more when they're in
- Increase tire and accessory sales
- Doll up the shop (pretty cheaply)

NAME _____

TITLE _____

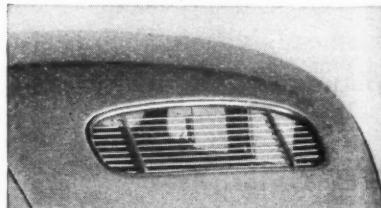
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STREET _____

CITY _____

STATE _____

MA-3

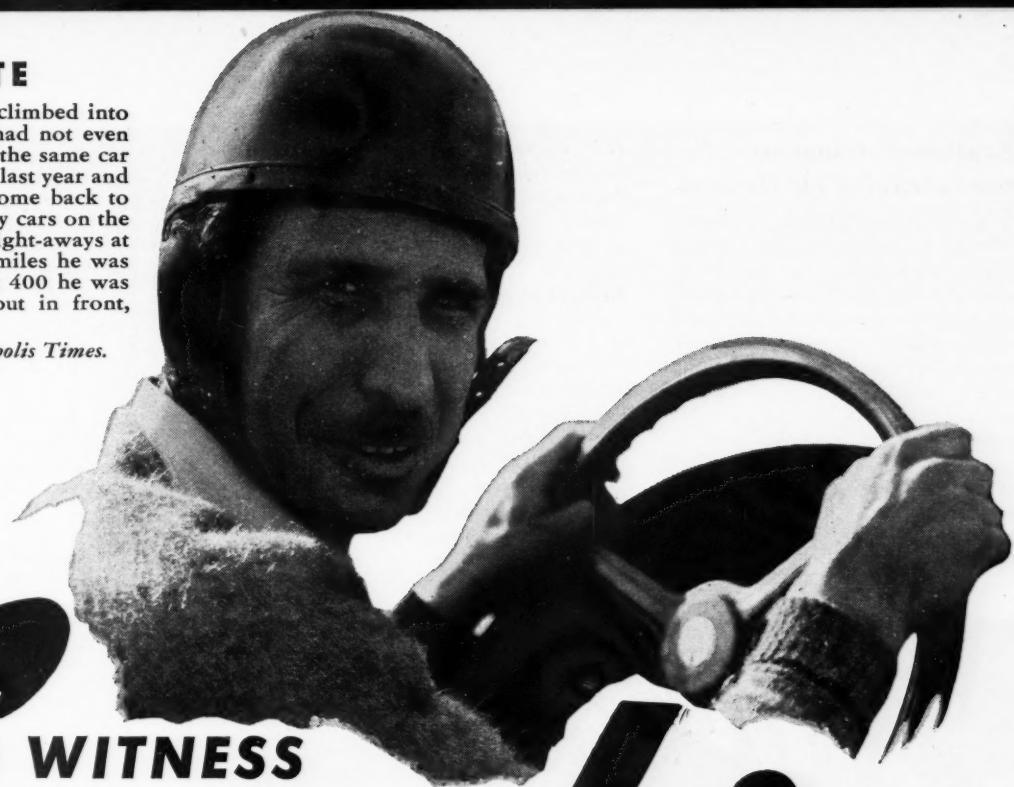


sion, these blinds do not interfere with the driver's vision, and yet they deflect the sun's rays to prevent fading of the upholstery. Slats are made of bass wood, finished in flat ivory, and the metal uprights with the spring tension hold the blind in place so that it will not rattle or vibrate. Prices range from \$3.75 to \$5.75, and the blinds are available for practically every make of car from 1937 to 1941 models.

A TRIBUTE

"At the 175 mile mark he climbed into Davis' Offenhauser which had not even been in the first 10. It was the same car Rose drove into third place last year and he handled it like a man come back to his first love. He swished by cars on the turns, roared down the straight-aways at breakneck speed. At 250 miles he was 8th, at 300 he was 4th. At 400 he was 2nd and at 405 he was out in front, never to be threatened."

—Indianapolis Times.



162,000 WITNESS

Mashing Victory BURD VICTORY AT INDIANAPOLIS

After relinquishing first place because his "pole winning" Maserati developed carburetor trouble, Mauri Rose took over Floyd Davis' seat in another of Lou Moore's three Burd equipped cars at the 177 mile mark and proceeded to pilot it all the way from 15th to 1st place. It was the most dramatic display of driving skill in the history of the famous Indianapolis International classics.

Cliff Bergere, driving the third Moore job, not only finished fifth but went the entire 500 miles without a stop, thus becoming the first driver of a gasoline-powered car ever to accomplish this tortuous task.

Burd is proud of the part that "Graf-Flox" Piston Rings played . . . for withstanding the punishment Mauri meted out on his dash for the coveted cash . . . for providing Cliff with gas and oil consumption so low that he could hang up his unusual record. Take a tip from the performances of these men and machines . . . switch to Burd "Graf-Flox" and put your jobs in the class of champions!

BURD PISTON RING CO., Rockford, Ill.



Floyd Davis qualified the winning car at 121.106 m.p.h. and drove it the first 177½ miles of the race, earning for himself the title of co-winner by so doing . . . Burd now can boast 3 wins in the last 5 years at Indianapolis . . . The reign of foreign built cars on this speedway is ended, for a year, at least . . . Bergere's was the car in which Roberts rode to victory in 1938, establishing the speed record that still stands . . . The Davis-Rose car was built for Roberts and was the one involved in the fatal 3-car accident in 1939.

BURD Graf-Flox PISTON RINGS

1942 Southwest Automotive Show Scheduled for Houston

The fifth annual Southwest Automotive Show is scheduled for Houston, Texas, with dates having been set as Jan. 22-25, 1942. In bringing the show back to Houston, it returns to the scene where the second annual Southwest Automotive Show was held in January, 1939. It will be staged in the Sam Houston Coliseum Houston's \$2,000,000 exhibition hall.

The show office is located at 511 Western Union Bldg., Houston, Texas. The officers for the fifth annual show are: Frank K. Meyer, president, of

Jos. F. Meyer Co., Houston; A. C. Stover, vice-president, of Sharp Auto Supply Co., Oklahoma City, Okla.; Lionel J. Ellis continues as secretary-treasurer and show manager.

Lubrication Chart Offered on Aircraft Engines

The fellows who are interested in aviation engine service will like the radial engine lubrication chart recently made available by the Norman W. Henley Publishing Co., 7 West 45th St., New York City. This is a large wall chart showing sectional views of late model twin-bank radials,



LINK-BELT ROLLER BEARINGS Assure Amazing Performance!



LINK-BELT COMPANY

519 N. Holmes Ave., Indianapolis, Indiana
Warehouses in all principal trading centers

Made by the makers of the famous
Silverstreak Silent Timing Chain!

LINK-BELT
SHAFER
ROLLER BEARINGS

8508

FOR
FRONT WHEELS
DIFFERENTIALS
AND
REAR AXLES

Head Chicago Sales

Appointments of Owen Knapp as manager and E. H. Sullivan as assistant manager of the Chicago branch of Reo Motors, Inc., are announced by E. R. Kroblen, Reo's general sales manager.



"I brought it in for the 1,000 mile check-up!"

printed in three colors with a special reference to lubrication and fuel systems, starting and operation, running and ground tests and regular inspection procedure. Copies will be supplied at a cost of 50 cents each. The chart was arranged by Lt. Col. Victor W. Page, U. S. Air Reserves.

M. R. Dill Elected Director of Lincoln Electric Co.

The Lincoln Electric Co., manufacturers of arc welding equipment, Cleveland, Ohio, announces the election of M. R. Dill as a director at its recent annual meeting of shareholders. Dill was also elected general counsel at the last meeting of the board of directors.

Dill graduated from Lakewood High School in 1925, attending the Wharton School of the University of Pennsylvania for his pre-law education. He was graduated from the Law School of Ohio State University in 1930.

Directors and officers who were re-elected include: J. C. Lincoln, chairman of the board of directors; J. F. Lincoln, president and general manager; C. M. Taylor, vice-president; A. F. Davis, vice-president and secretary; G. G. Landis, chief engineer; Harold F. Kneen, plant superintendent; J. W. Merriam and W. B. Stewart.

A LOT
DEPENDS
ON
TIMING



EVERY FAN KNOWS that good baseball depends a lot on perfect timing. And men who know engines know that getting top power and performance out of a modern car calls for *correct ignition timing*.

Remember, you give your customers better running automobiles when you set the spark—and set it right! And that'll go a long way toward bringing them back to your shop the next time they need service.

Whenever you reset ignition timing, whether you do it as a single operation or as part of a general motor tune-up, be sure to advance the spark far enough toward the maximum power setting to take advantage of the extra power available in today's higher anti-knock gasolines. And explain to your customers that the higher the anti-knock quality of the fuel they use, the farther you can advance the spark toward the maximum power setting without "knock."

Ethyl Gasoline Corporation, manufacturer of anti-knock fluids used by oil companies to improve gasolines.



SET THE SPARK FOR TODAY'S BETTER GASOLINES

Stewart-Warner Employees To Receive Week's Bonus

The Stewart-Warner Corp. will pay one week's bonus to all weekly and hourly employees who have been in the employ of the company one year or more, it is announced by James S. Knowlson, president, in a letter to employees. Workers who have been with the company less than one year will receive proportionate payments. Payment will be made June 30.

In the same letter, it is revealed that sales up to May this year were

30 per cent ahead of the same period last year. A dividend of 25 cents a share will be paid at the same time the bonus is disbursed.

Heads Pittsburgh Region

Harold VanDerZee has been appointed manager of the Pittsburgh region of the Dodge organization, a post made vacant by the transfer of E. C. Quinn, to the management of the New York region. VanDerZee goes to Pittsburgh from Philadelphia where he was assistant regional manager.

Packard Produces First Rolls Aircraft Engine

Less than eight months ago the Packard Motor Car Co. signed a contract with the United States and British governments to produce 9000 of the famed Rolls-Royce airplane engines used to power the Hurricanes and Spitfires now flying in defense of England. Signing of the contract Sept. 20 distinguished Packard as the first American company ever to undertake construction of the famous engine.

The Rolls contract called for a tooling and machining program in excess of \$28,000,000. Many of the 3000 machines in this plan had to be designed for the job. All had to be ordered. Today, more than 50 per cent of these machines are in place in the new factories and others are pouring in daily.

With the completion of test Rolls Engine No. 1 on May 13, Packard produced this first all American-built foreign engine less than seven months after the contract was signed.

Graham Named Honorary Chairman by Purolator

At a special meeting of the board of directors of Purolator Products, Inc., Newark, N. J., held May 1, John A. Graham was elected honorary chairman of the board. Active in many phases of the automotive industry since 1907, Graham is widely known and respected throughout the industry. He was associated with American Simplex, Houdaille and Studebaker Corp., and since 1925 has been president of Purolator Products, Inc., formerly Motor Improvements, Inc.

Ralph R. Layte, who has been executive vice-president, was elected president of the company. He has been associated with Purolator since 1925.

Piston Ring Sets

Complete piston ring sets for 11 popular makes of cars are now available in the 10-Up combination ring set made by Ramsey Accessories Mfg. Co., 3693 Forest Park Blvd., St. Louis, Mo. They are engineered especially for use in connection with new pistons and reconditioned cylinders in either rebore jobs or rebuilt motors. Each set uses a one-piece tapered compression ring, a low pressure spring-type compression ring, and a spring-type channel oil ring. The channel spring-type oil ring is designed to resist scuffing and scoring, and has extra wide slots for oil drainage.



NOW'S the time you need good tools! . . . Car owners everywhere are bringing in the "old bus" to give it that long delayed overhaul, and they're going to the shop where they know they can get the best work done in the fastest time.

That's why you need good tools now! And that's the reason you should own this set . . . it equips you with a complete selection of wrenches and hand tools to get those repair jobs out in a hurry . . . lets you work easier with the right tool for every job . . . Rid your kit of worn out, obsolete tools . . . get this set complete or buy it a few tools at a time . . . equip yourself today for better, easier work tomorrow. See the Snap-on man or write . . .

MORE REPAIR WORK . . . FEWER TO DO IT!
**TOOLS WILL TELL
IN '41!**

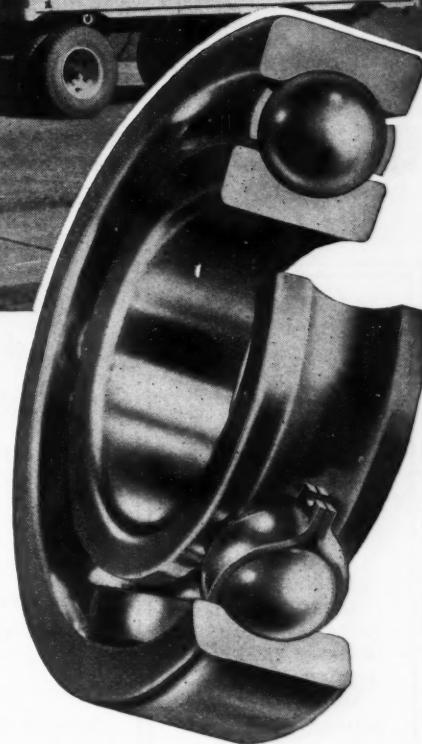
SNAP-ON TOOLS CORPORATION
Dept. MA-6 • Kenosha, Wisconsin

Snap-on **SERVICE TOOLS**
The Choice of Better Mechanics



BUILT BY KENWORTH MOTOR TRUCK CORP.

Transportation Jeans



HEAVILY ON SKF BEARINGS

If every SKF-equipped vehicle in America were to stop, Transportation would slow down to a snail's pace. So garage owners, repair men, and fleet

superintendents join hands in making sure the bearings on their trucks, buses, autos, etc., receive the little attention they require.

4805

SKF INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILA., PA.

SKF
BALL AND ROLLER BEARINGS

Gets K-D Account

The K-D Lamp Co., of Cincinnati, has appointed Keeling & Co., Inc., Indianapolis, as advertising and merchandising counsel.

Harold F. Griffin, newly appointed sales manager of K-D, announces that a more aggressive advertising and merchandising policy will be adopted.

New Construction Speeds

Distribution of Parts

A step that will facilitate the movement of parts from factory to dealers and from dealers to the consumer

is the construction of a new floor on the national parts distribution office building at Flint, according to Charles E. Wetherald, Chevrolet manufacturing manager. The new construction will make available a total space of 240,000 square feet, an increase of 60,000 square feet over the present total of 180,000 feet.

Wetherald pointed out that, in the parts distribution set-up, there are four other major inventory control depots in Oakland, St. Louis, Atlanta, and Bloomfield, N. J., and a total of 52 parts warehouses placed in strategic locations throughout the country.

Fast Service

ON ELECTRIC TOOL REPAIRS

25

Factory Branches

ATLANTA, GA.
BOSTON, MASS.
BUFFALO, N. Y.
CHICAGO, ILL.
CLEVELAND, OHIO
DALLAS, TEXAS
DENVER, COLO.
DETROIT, MICH.
INDIANAPOLIS, IND.
KANSAS CITY, MO.
LOS ANGELES, CAL.
MEMPHIS, TENN.
MINNEAPOLIS, MINN.
NEW ORLEANS, LA.
NEWARK, N. J.
NEW YORK, N. Y.
OAKLAND, CAL.
PHILADELPHIA, PA.
PITTSBURGH, PA.
SAN FRANCISCO, CAL.
SEATTLE, WASH.
ST. LOUIS, MO.
TOWSON, MD.
TORONTO, ONT.
MONTREAL, QUE.

"Van Dorn"

**Has Factory Service
Branches From
Coast-to-Coast!**

When you use Van Dorn Tools, you don't have to send 'em "back to the factory" for servicing. No matter where you are—there's a Van Dorn Service Branch within quick reach—equipped with repair and servicing facilities, manned by *factory-trained* mechanics. You get "factory" service with no delays, no valuable time wasted. All Service Stations are operated by Van Dorn to assure you of genuine replacement parts and responsible service—backed by the Van Dorn guarantee. Van Dorn Electric Tools, 727 Joppa Rd., Towson, Md.

"Van Dorn"

(DIV. OF BLACK & DECKER MFG. CO.)

THE "RED HEADED" PORTABLE ELECTRIC TOOLS



"Sure I'm walking home—he's developing pictures!"

Connaughton Is Named President of Memphis Group

At the annual meeting of directors in May, new officers of Memphis Automobile Dealers Association were elected. W. A. Connaughton, president of Union Chevrolet Co., was elected president, succeeding W. H. Claypool who was named secretary-treasurer. W. H. Fisher, of the John T. Fisher Motor Co., was elected vice-president. H. H. Hull, of Hull-Dobbs, and J. J. Corbitt, president, Corbitt Motor Co., were named directors.

Named Vice-President

At the annual meeting of the board of directors of the Barcalo Manufacturing Co. in May, Charles Vallone, formerly vice-president, was promoted to the position of first vice-president, and Alban W. Kirton, secretary, to the position of vice-president and secretary. All other officers were re-elected, namely:

Chairman of the board, E. J. Barcalo; president, N. M. Graves; treasurer, F. A. Chandler; assistant treasurer, G. J. Letchworth, Jr.; assistant secretary, G. N. Abt.

Adds 3 to Sales Staff

Assignments of new men to three western sales territories are currently announced by Charles R. Crowder, sales manager of the Automotive Division of the Van Norman Machine Tool Co., Springfield, Mass. Under these assignments, A. L. Davidson goes into the Pacific Northwest territory. R. C. Holroyd will cover northern California, Oregon, Nevada and Utah. And A. D. Carterlin has started in with E. A. ("Slim") Carmichael in southern California and Arizona.

The
CONNECTING LINK
between
QUALITY and PRICE

Wiry Joe BATTERY CABLES

PRICED TO BRING YOU PROFITS FROM THE BIG MASS MARKET

You don't often find a top quality line at volume market prices. But that's what you get in Wiry Joe.

You can't miss the eye-catching sales appeal and top-notch performance of the entire Wiry Joe line. Every heavy-gauge battery cable has lustrous, black lacquered insulation . . . plus heavy terminals that prevent "bottle-necks" in the flow of current.

And as to price . . . Wiry Joe is produced by the biggest independent company in the industry, with direct control of manufacturing processes from start to finish. Result: a price schedule that brings in the big, mass market . . . with no sacrifice in profit!



Wiry Joe

AUTOMOTIVE WIRING
PRODUCED BY THE

DOSTAM METHOD

BY THE

CRESCENT CO. - Pawtucket, R. I., U. S. A. - Montreal, Canada

FIVE STEPS TO SUCCESS

If any set of rules could insure the success of an automobile repair shop, those rules would probably include:

1. Have the shop properly equipped.
2. Build up confidence through turning out good work.
3. Be courteous to all customers.
4. Have a complete cost system of profits and losses.
5. Operate a systematic, clean shop.

Let's analyze each of these five rules.

(1) *Have the shop properly equipped.* This is first and most important, because, if you don't have a well-equipped shop you can't turn out good work, and good work is of basic importance.

By having a well-equipped shop, I do not mean that you must invest a large amount in special machines, tools, and other equipment. This would be out of reason, because the majority of men who start out in the service business have only a limited amount of capital, and cannot afford to go to extremes in spending it. You



Air Corps officers from the 17th Bombardment Group, stationed at McCord Field, Wash., are, left to right: Lt. D. M. Jones, Major Charles B. Overacker, Jr., Capt. H. W. Pennington, and Lt. Adam J. Heintz. The planes are B-25 twin-engine medium bombers. The car is a 1941 Pontiac station wagon.

should, therefore, buy equipment that is absolutely essential and universal in its uses.

Many shop owners first buy a metal-turning lathe (one that is

equipped to cut threads) and a few of the most necessary tools and accessories. The lathe can be used for refacing valves, truing armatures, machining pistons, making special



No lubrication job is satisfactory unless all squeaks and "birdies" are removed. You need these specialized lubricants to complete your service — they "last the life of a lube job".

Order the "All-American" Trio from your jobber.

DOOR-EASE
Dripless Oil

Enters as a rapid penetrating oil . . . congeals to a lasting, dripless lubricant. Use for hinges, locks, brake fittings and other concealed friction parts. "Runs in . . . Will not run out".

DOOR-EASE
Stainless Stick Lubricant

For exposed friction surfaces. Stops squeaks, binding and wear of door dovetails, striker plates, rubber bumpers and seals, hood lacings, etc. Won't stain clothing or car upholstery.

RUGLYDE
Rubber Lubricant

For rubber parts requiring a penetrating lubricant. Safe on rubber — Lubricates and preserves. Safe on car finish — Won't harm the finest lacquers. Safe on service man — Non-flammable, non-poisonous.

AMERICAN GREASE STICK COMPANY, MUSKEGON, MICHIGAN
Canadian Sales Representatives: COLONIAL TRADERS, Ltd., 144 FRONT STREET W., TORONTO

bushings, besides many other jobs that require general machine work. The writer highly recommends a lathe as the most universally useful piece of equipment in the auto repair shop.

If your shop is properly equipped, your work can be completed in much less time and, when finished, will be more accurate. This naturally leads to the next rule.

(2) *Build up confidence by turning out good work.* Every job that comes into your shop should be handled to the best of your ability. Do a poor job and the customer will always remember it. You will not only lose this customer, but many others, because he will tell other prospects who would have come to you if your work had been satisfactory.

(3) *Be courteous to your customers.* It doesn't matter what kind of commodity or service you are selling, you must be courteous or polite to your customers. Such little phrases as "Good morning," "Thank you," "Call again, please," etc., require little effort, yet they mean much in creating a favorable impression in the mind of the customer.

(4) *Have a complete cost system of your business.* All successful shop owners keep a complete cost system. They can tell at a glance whether they are making money or losing it.

Quick-Charger Announced

Hunter-Hartman Corp., 2665 Washington Ave., St. Louis, Mo., has announced a new battery quick-charger to be known as the Rocket. This latest addition to the Kwikurent line of battery charging equipment is equipped with a sensitive rapid battery analyzer to test and analyze a battery, and controls its rate of charge according to the condition of the battery. A protector switch automatically shuts off the charger when overloaded, preventing damage to the machine or to the battery. Charges battery in or out of the car in from 15 to 40 min., according to the manufacturer.



In this way, when they begin to go "downhill," they can tell exactly what jobs or operations should be best at that particular time of year, and, through a little advertising or sales promotion, can gain more profits from their advertising dollar.

A well-kept cost system also will tell you how much you can safely spend each month. Many go to extremes, as they do not actually know how much they are making, and soon find themselves bankrupt.

(5) *Operate a systematic clean shop.* In the eyes of the public, the general appearance of the shop is an index to the kind of work you put

out. When John Public enters your shop and finds everything clean—the tools systematically arranged in neat order—he knows at once that you will take special care in doing the job he requires. You will not only profit, because people always patronize a clean shop, but the mechanic can do much better work and will waste less time if everything is in order.

No business is run perfectly, there are always ways of making improvements. The successful man is the one who is continuously forging ahead with original ideas and searching for new methods to keep his customers satisfied.

Cash-in on tune-up work the sure easy way! ELIMINATE GUESSWORK BY USING A **Shurhit** **STROBOSCOPIC ANALYZER**

Tune-up service is big business . . . it's profitable business—and with an amazingly small investment it's a major service you can add to your present business. Greater mileage per gallon of gas, and peak performance under all conditions are factors which appeal to car owners, and it has been proven that dealers can sell tune-up service, and make real money, providing they use modern equipment such as a Shurhit Stroboscopic Analyzer.

What others are doing, YOU can do. For example, take the experience of Jack Warren of Warren Automotive Co., Milwaukee. Mr. Warren writes—

"The Shurhit Stroboscopic Analyzer does pay for itself in dollars and cents, and it has increased our tune-up business to an unbelievable extent in a short period of time. . . . We are selling four to five times as many ignition repair parts now compared to what we were selling before we purchased our Stroboscopic Analyzer."

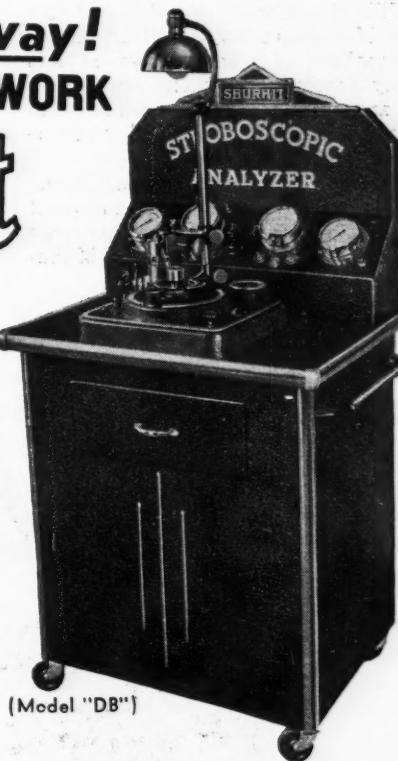
YOU, too, can really go to town with a Shurhit Stroboscopic Analyzer. It takes all the guesswork out of tune-up service and enables you to quickly and easily turn out jobs that are 100% accurate.

Make Big Profits on Small Investment in

SHURHIT IGNITION PARTS



Ask your Shurhit jobber or write us for details on General Ignition Assortments of fast-moving parts . . . Contact Points . . . Condensers . . . Rotors . . . Caps . . . Coils . . . Switches, etc.



(Model "DB")

**ONLY \$11.00
a month**

The Shurhit Stroboscopic Analyzer accurately discloses the true condition of the distributor, as well as the coil and condenser, if the coil on the car is used. It also shows presence of worn bearings, worn shaft, or both; rough cam, uneven cam, weak contact springs, poor condition of contacts, improper spacing of contacts, as well as the performance of the coil and vacuum spark modifier in coordination with governor advance. This equipment enables you to detect trouble, make corrections, check your work and profitably merchandise tune-up service. It also helps sell ignition parts—thus showing you double profits.

SHURHIT PRODUCTS, Inc.

Waukegan, Illinois

Send details on Model "DB."
 Also send details on General Ignition Assortments.

SIGNED

FIRM NAME

ADDRESS

CITY STATE

NAME OF JOBBER

**American Brakebloc Sales
Show 81 Per Cent Increase**

Paul B. Hoffman, general sales manager of the American Brakebloc Division of the American Brake Shoe and Foundry Co., reports that the division's first quarter dollar volume sales for 1931 are 81 per cent above first quarter 1940 sales. The largest part of this increase is due to growing volume in American Brakebloc brake materials in both the replacement markets and in original equipment sales to automotive manufacturers for trucks and passenger cars. Clutch facings and other items, however, show satisfactory advances.

**Sales Representatives
Are Appointed by Bear**

Will Dammann, president of the Bear Manufacturing Co., Rock Island, Ill., makers of wheel alignment and safety testing equipment, announces the appointment of sales representatives for the Ohio and Northwest territories.

Lewis L. Gander, Adrian, Mich., well-known automotive equipment salesman and former national accounts representative for the Weaver Manu-



"Let's see them cars with no clutch pedal!"

facturing Co. of Springfield, Ill., will serve in Ohio.

Representing the Bear company in Oregon, Washington, and Northern

Idaho, is S. S. McClelland, formerly of Santa Monica, Cal. McClelland, a veteran in the field of wheel alignment, will be located in Portland, Ore.

USES LESS CURRENT



Multiple cylinders . . . large inter and after cooler radiation surfaces . . . elimination of clumsy pipe fittings . . . smooth, vibrationless operation —these are PAR features that insure lower power costs. Buy PAR and you will pay for less current!

By Comparison — You'll Buy

PAR

**"HOW TO BUY AN AIR COMPRESSOR" . . . a fact-filled catalog
and check list — is yours for the asking. Write for your copy today!**

MODERN EQUIPMENT CORP.
DEFIANCE, OHIO, U.S.A.



FITZGERALD service—long wear, heat-proof, positive sealing—is a strong point with me. The way our Fitzgerald installations stand up in the long haul, high-compression jobs that really bring the money into this shop, is the way to keep good customers satisfied. And we've found that satisfied customers come back themselves and tell their friends about us. The Fitzgerald Bulldog Gasket takes care of our toughest jobs. It just won't burn. The complete Fitzgerald line fills the bill for everything else in the gasket and grease retainer line; any make, any model, any year—'way back to 1906. Send for free copy new Gasket-Getter Chart No. 121 listing sets exclusively.

The Fitzgerald Manufacturing Company, Torrington, Connecticut. Branches, Chicago and Los Angeles — Canadian FITZGERALD Limited, Toronto.



The FITZGERALD Line
Copper Asbestos Gaskets
Metal Kore Asbestos Gaskets
FITZ-Rite Gaskets
Cork Gaskets
Gaskets of many other types,
materials, and construction
Grease Retainers

FITZGERALD GASKETS

SINCE
1906

THE COMPLETE LINE THAT COMPLETELY SATISFIES

JOBBER'S DIGEST

OF THE JUNE MOTOR AGE

FOLLOWING is a brief digest of important articles appearing in this issue of MOTOR AGE. Read the digest and discuss the service procedure with your customers.

TRACTOR BRAKES

For the service man whose shop is located beyond the great cities—and that means most of them—this picture article provides complete instructions on relining and servicing brakes on the Farmall tractor Model F20.

FAST CHARGER HELPS BUSINESS

One of the first general-repair shops to install a fast battery charger reports that the new equipment has tripled its battery service business and greatly increased its sale of new batteries. In this article, the service man explains the reasons for this showing.

HEADLIGHT SERVICE

A useful article on testing, servicing and adjusting headlights that have lost their original power. It emphasizes the value of headlight testing equipment and outlines testing and trouble shooting procedure.

SUPER SERVICE

Profiting by the mistakes of others is nearly always possible, but few actually do. The shop about which this article is written is one of the few. It was deliberately planned to take advantage of opportunities neglected by many shops.

BRONZE WELDING OF BUMPERS

Full instructions in text and pictures on repairing damaged bumpers. It is not only faster and cheaper for the service man, but restores to the bumper virtually all its original strength.

GENERATOR SECRETS

Here is another one of those valuable instruction pieces the readers of MOTOR AGE always welcome. It deals with generator service in a way that makes it easy for any service man to diagnose troubles and remedy them. Knowledge of the principles discussed greatly simplifies the task of servicing the generator, cut-out, brushes, and commutator.

HOW'S BUSINESS

A MONTHLY REPORT ON MAJOR ITEMS BY 500 JOBBERS

MAY, 1941

NATIONAL TOTAL	Good	Fair	Poor	NATIONAL TOTAL	Good	Fair	Poor
ACCESSORIES							
TIRES							
Abrasives	34	48	19	Casings	47	50	50
Anti-Freeze	28	84		Tubes	40	49	66
Car Radio Sets	11	32	40				
Car Radio Accessories	4	30	29				
Chains		10	88				
Heaters	3	9	108				
Horns	9	37	69				
Laquers	78	82	48				
Oil Filters	83	49	29				
Oils and Greases	31	45	76				
Polish	27	38	79				
Seat Covers	37	46	75				
Thermostats	2	20	82				
REPLACEMENT PARTS							
Axle Shafts		12	41	Good			
Ball and Roller Bearings		72	81	Fair			
Brake Lining		75	66	Poor			
Bushings		27	55				
Chains (Timing)		10	48				
Clutch Plates and Parts		75	29				
Fan Belts		81	50				
Gaskets		92	75				
Gears (Rear Axle)		15	51				
Gears (Transmission)		17	48				
Mufflers		109	55				
Pistons		34	48				
Pins		36	47				
Rings		103	37				
Radiators and Cores		2	20				
Spark Plugs		90	57				
Springs (Chassis)		9	51				
Valves		35	40				
Water Pump Parts		69	92				
Engine Bearings		91	91				
ELECTRICAL UNITS							
Armatures		19	48	Fair			
Batteries		32	59	Poor			
Cable (Battery)		51	95				
Coils		50	68				
Other Ignition Parts		70	70				
Fuses		29	70				
Ignition Wire and Cables		59	75				
Lamps		55	97				

MOST ACTIVE LINES

Positions of Leaders	May 1941	May 1940	June 1940	Positions of Leaders	May 1941	May 1940	June 1940
Mufflers	1	1	1	Ball & roller bearings	11	11	12
Rings	2	5	4	Other ignition parts	12	16	16
Gaskets	3	3	2	Water pump parts	13	15	14
Engine Bearings	4	2	3	Ignition wire & cables	14		
Spark plugs	5	7	7	Lamps	15	14	18
Oil filters	6	4	5	Battery cables	16		
Fan belts	7	6	6	Coils	17		
Lacquers	8	8	8	Tire casings	18		
Clutch plates & parts	9	10	9	Tubes	19		
Brake lining	10	12	10	Seat covers	20	9	11

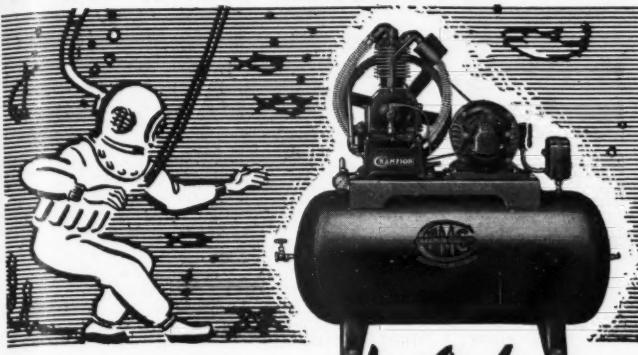
HOW ITEMS ARE RATED

"Most Active Lines" are chosen on the basis of the highest number of jobber reports indicating "Good" for the items selected among the twenty most active lines. "Activity" as used here has no bearing on volume, so the lists should not be interpreted as meaning the lines on which jobbers are enjoying the greatest volume. Most active lines are those which the greatest number of reporting wholesalers indicate are selling "considerably above normal" in their particular markets.

HOW TO READ THIS CHART

Information from which this chart is compiled is obtained monthly from a selected list of 500 wholesalers. Figures show the number of wholesalers reporting. Normal is taken as average sales for this month during the past few years.

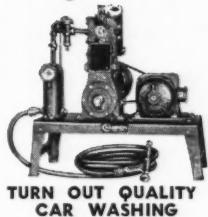
Good—Sales considerably above normal.
Fair—Sales slightly above or below normal.
Poor—Sales noticeably below normal.



PLenty of AIR for Only \$190

A deep sea diver can't get along on "half rations" of air. Neither can a service station afford to risk customer dissatisfaction caused by a scanty air supply.

That's why so many operators are specifying this Champion SE-26-60 single stage compressor for locations requiring not more than 150 pounds pressure. Displacing 7 cubic feet of air per minute, it furnishes ample air for peak requirements of a car lift, two tire lines, grease gun, spring oiler and intermittently used spray painting gun. Features include: sealed crankcase . . . centrifugal unloader . . . totally enclosed crankcase . . . etc., etc. Price, ONLY \$190.



TURN OUT QUALITY CAR WASHING WITH THIS H-1

Makes every job easier, faster and better! Delivers 5 gallons of water per minute at 300 pounds pressure. Costs ONLY \$195. WRITE NOW for FREE catalog on complete line of Champion compressors and car washers. CHAMPION PNEUMATIC MACHINERY CO., 8192 South Chicago Ave., Chicago, Ill.

CHAMPION
COMPRESSORS & CAR WASHERS

FLEET OWNERS SAY "DO-RAY is O. K."

Swa-Bac All-Rubber CLEARANCE LAMP



Survey shows this type most popular with fleet owners. Entire body made of rubber. Vibration proof — waterproof — dustproof. Furnished in red, green, amber or white. Single contact 3-cp. No. 63 bulb.

No. 2136 — List Price 50c

Giant Lite — with Angle Bracket



For truck bodies extending a great distance beyond rear axle. Four different mounting positions possible. Overall diameter 7 $\frac{1}{4}$ in. Lamp body of heavy gauge steel, 5 feet heavy duty wire. Waterproof — dustproof — vibration proof. No. 70 Lamp with 32 cp. Bulb. List Price \$4.00

ALL-RUBBER 3-JEWEL LAMP

For clearance, marker or parking. Waterproof — dustproof — vibration proof. Lenses interchangeable to meet legal requirements.



Lamp only. Can be used as a fender lamp. Equipped with No. 63 S. C. bulb. 1106-3, 3 Jewels, List Pr. 80c 1106-2, 2 Jewels, List Pr. 75c

With heavy metal angle bracket. Cadmium plated. Equipped with No. 63 S. C. bulb.

1106-B3	3 Jewels
List Price	85c
1106-B2	2 Jewels
List Price	80c

The rubber lamp is protected by a heavy cadmium plated metal guard. Equipped with No. 63 S. C. bulb.

1106-G3	3 Jewels
List Price	90c
1106-G2	2 Jewels
List Price	85c



DO-RAY
LAMP COMPANY
1458 S. MICHIGAN AVE. • CHICAGO
SAFETY LIGHTING AND REFLECTING EQUIPMENT

Dove-tail

NEWEST BALANCE WEIGHT ADVANCEMENT HEAVY DUTY TRUCK

—Mid-Western Auto Parts, Manufacturers of the SNUGL FADE-AWAY wheel balancing weight announce their newest advancement for wheel balancing weights. The balance weight with a DOVE-TAIL CLIP. The weight that is SELF-LOCKING, has a BULL-DOG grip, and is easier to install and adjust.

—The DOVE-TAIL CLIP is what everyone has been waiting for. The automobile owner will buy it. The dealer has wanted it. The jobber asked for it. We have produced it. Order Now.

—Mid-Western Auto Parts also announce their new HEAVY DUTY TRUCK WEIGHT in sizes: $\frac{1}{2}$ —1— $1\frac{1}{4}$ —and $1\frac{1}{2}$ pound. The heavy duty weight that is built for heavy duty work. The weight that has been needed for a long time. Now Mid-Western has it.

—Don't lay this ad aside! Write your jobber or factory today.

Mid-Western Auto Parts

Manufacturers

824 E. Elm

Kokomo, Indiana

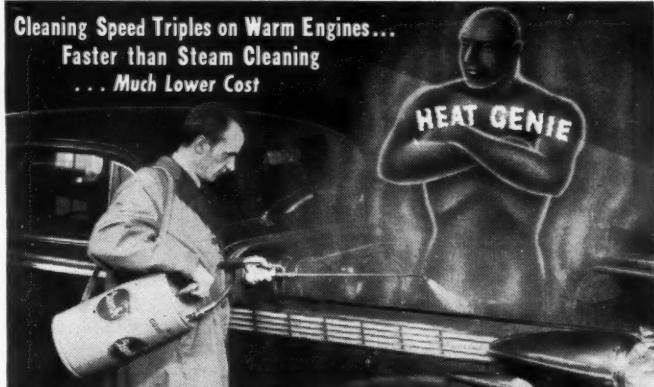
Western Distributor: Kenneth V. Mills

423 W. Eighth St.

Los Angeles, Calif.

Cleaning Speed Triples on Warm Engines...

Faster than Steam Cleaning
... Much Lower Cost



GUNK P-96

Faster Than a Steam Cleaner
... on Warm Engine Blocks

General purpose garage and chassis degreaser. Dilute 9 parts low-cost kerosene . . . brush or spray on parts to be cleaned.



List Price \$12.00

40 lb., 5-gal. size

FOR DEALER NET
COST—SEE COUPON →

CURRAN CORP.
MFG. CHEMISTS, Malden, Mass.

Not in stock at my jobber . . . attached to my business letterhead is my check, or M.O. on the condition that you ship me a 40 lb., 5-gallon size, GUNK at dealer's net cost \$7.20—(\$8.00 west of the Mississippi) by FAST PREPAID AMERICAN EXPRESS . . . free of charge.

NAME
ADDRESS
CITY
STATE



FOR QUICKER, BETTER, MORE ECONOMICAL Body Washing MAGNUS NXL

The new, easy-to-use cleaner that sets new standards of speed, low cost and top-notch appearance in car washing.

Harmless to all painted surfaces, easy on the hands, lightning quick in action. NXL is a concentrated material. A little goes a long way.

CLEAN THE MODERN WAY

Just brush or sponge on the NXL solution. (Where many cars are washed at a time, you can spray it on.) Then agitate with soft brush and rinse it off with a hose. That's all! Watch the rinse water "sheet off." See how little chamoising is needed. Note the absence of streaks. And above all, note the "just painted" lustre which you get.

Clean your cars the quick, economical, modern NXL way!

GET THE MAGNUS AUTOMOTIVE CLEANING HANDBOOK

Write now for your copy. It's full of money saving ideas you can use right away.

MAGNUS CHEMICAL COMPANY

Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils, Emulsifying Agents and Metal Working Lubricants.

36 South Avenue

Garwood, N. J.



MAGNUS CLEANERS

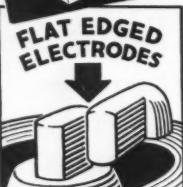
LEONARD

THE ONLY PATENTED

air
Cooled

SPARK PLUGS

in NEW
Packaged Sets
to fit
CHEVROLET



ANNOUNCING

Leonard No. 10-E to fit 1941
Chevrolet Passenger Cars
and Light Trucks.

Leonard No. 10-F to fit 1941
Chevrolet Trucks (heavy duty
service).

THESE new 10 mm. Leonards complete our line of
Packaged Sets, designed and spaced for all Chevrolet
installations from 1933.

Air-cooled for continuous top performance. Note the
flat electrodes with side-spacing instead of top-spacing,
a feature that prevents oxidization of firing points, and
holds gap spacing.

Test Leonard Spark Plugs for yourself against any plug on
the market with equal gap spacing, and you'll be amazed
at the extra fatness and intensity of Leonard's blue spark.

LEONARD SPARK PLUG CO., NEWARK, N. J.

The Most Complete
Line of Passenger Car
and Heavy Duty Spark
Plugs

If your Jobber can't
supply you send us
his name.

FOR THE OIL GASOLINE & WATER CONNECTIONS VELLUMOID

MAURI ROSE WINS

(Continued from page 20)

Making its first appearance at the track was the V-8 Winfield engine in Car No. 54, driven by Ralph Hepburn. This was a brand-new engine, and featured an intercooler for the intake charge. In general, the engine followed the conventional V-8 design, with overhead camshafts for each bank of cylinders. A large centrifugal-type supercharger was mounted at the rear, drawing from three down-draft Winfield carburetors. The outlet for the supercharger consisted of a large pipe with sweeping bends to avoid a sudden change of direction of the mixture, and connected through the block to an intercooler mounted at the top of the engine, in between the "V." This intercooler was an aluminum alloy casting, heavily finned, and incorporating a central air passage and a mixture passage. The central air passage was fitted with an air scoop having its opening in the upper half of the radiator shell, immediately above the core.

Car No. 5, driven by Joe Thorne, offered the outstanding feature in carburetion. It was a 6-cylinder Sparks engine, and was fitted with six horizontal-draft Winfield carburetors. Each carburetor was mounted directly opposite each cylinder intake port. Emil Andre's car No. 19 also had horizontal-draft carburetors, using four of its 6-cylinder Lencki engine. The car driven by Ted Horne, which incidentally was the car driven by the late Jimmy Snyder when he set the existing track record for a single lap, was fitted with a single horizontal-draft carburetor, while the older 4-cylinder Offenhauser and Miller engines continued with the up-draft type generally, although some had been redesigned to take the down-draft carburetor.

Keen disappointment was expressed by officials and spectators alike when the French-built 6-cylinder Talbot, driven by Rene LeBegue failed to qualify at a speed high enough to win a place in the starting line-up. Although it qualified at 115.603 miles per hour to beat the required 115 miles per hour necessary for entry, other cars qualified faster to force it out of the race.

Cushion Company Expands

To meet the demands of expanding business Comfort Cushion Co. has moved from its former location at 5301 Grand River Ave. to larger and more modern quarters at 5084 Loraine, according to Adolph H. Lichten, president of the company.

VELLUMOID GASKETS

VELLUMOID Gaskets and VELLUMOID Sheet are Quality Products backed by 28 years of experience. You can rely on VELLUMOID.

Sold through Jobbers. The Vellumoid Co., Worcester, Mass.

BLUE CROWN
SPARK PLUGS

FINNED SHELL SAVES GAS

Ask your Jobber
MOTOR MASTER PRODUCTS CORP.
4757 Ravenswood Ave., Chicago, U.S.A.
Export Distribution
Borg-Warner International Corp., Chicago

SPEAKER MATCH PATCHES

You make more friends, higher profits, with Speaker "MATCH PATCH". Guaranteed TUBE REPAIRS. Unsurpassed in Quality and Performance. Hermetically sealed in patented MOISTURE-PROOF PLIOFILM. Instant lighting Wick Fuse. Fit any clamp. Box of 50's-\$1.45. Order from your Jobber TODAY!

J. W. SPEAKER CORPORATION
1661 North Water Street
Milwaukee, Wisconsin

**PROMPT SERVICE,
HIGH QUALITY**

Means More
Profit for You

TELEOPTIC SIGNALS
THE TELEOPTIC CO.
RACINE, WISCONSIN

For Seals of Security
Industry depends on...

VICTOR
GASKETS, OIL SEALS, GREASE RETAINERS

Named Sales Manager

Paul C. Johnson, vice-president of the Sealed Power Corp., announces the promotion of George W. Davies to the position of sales manager, Original Equipment Piston Ring Division. For the past seven years Davies has been manager of the Detroit office and has been contacting original equipment customers.

He has been associated with the automotive parts industry for a number of years having been employed by the Campbell Wyant & Cannon Foundry Co. of Muskegon, prior to his connections with the Sealed Power Corp.

The Sealed Power Corp. will be represented in the Detroit area by George L. Hawn, who has been connected with the company since 1925, and by Donald W. Smith, who has been recently added to the Detroit office staff in the capacity of sales engineer.

Promoted by Goodrich

K. E. Hopkins has been named sales promotion manager of the Automotive Accessories Department of The B. F. Goodrich Co., it is announced by E. R. Bell, department manager.

Hopkins, a graduate of Ohio State University with a degree in business administration, joined the company's advertising department in 1928 and held various posts previous to being named assistant manager of the group buying and selling organization in 1938.

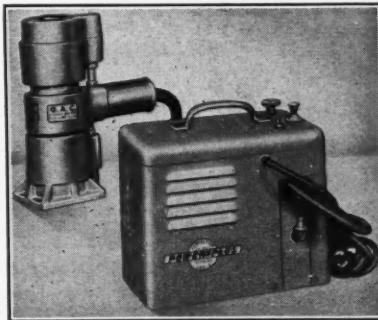
Hopkins succeeds R. F. Snyder, who has become sales manager of the Chek-Chart Corp.



"But, officer—I didn't make a U turn—
I made a figure 8!"

**Every Shop Needs
This New Hydraulic
Jack**

**THE G.A.C. AUTOMATIC
TWO-SPEED,
TWIN-CYLINDER
POWER UNIT**



Two high-speed pumps quickly force ram to contact load, then automatically cut out and powerful slower speed pumps lift load. Two cylinders working at all times give continuous uninterrupted flow of power to ram.

**Pays For Itself
on First 6 Jobs**

H-289
PERFECTION
POWER-PLUS
UNIVERSAL
FENDER
SPREADER



Modern fenders demand it for close work where wide spreading is necessary and for spreading between fender and fender well. Closes to 1 1/4" and opens to 1 3/4" with 6" ram travel. \$14.75.

**When You Need
Power in a
Small Area**

**THE
H-80**
PERFECTION
POWER-PLUS
PUSH-PULL
SPREADER



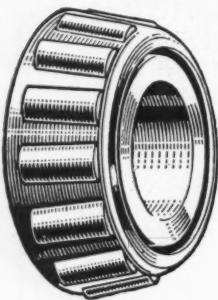
for use with Perfection Push-Pull Jack. Ideal for trunks, pushing out sills, etc. Fits into 1" space. Open width 5 1/2". \$8.50.

Order from your jobber
or write for catalog.

G. A. C. MFG. CO.
ASHLAND, OHIO

PRATT TAPERED ROLLER BEARINGS

The Perfect Replacement



Recognized as the Standard Replacement Bearing by Jobbers and Servicemen everywhere.

ESTABLISHED 1893

WM. E. PRATT MFG. CO.
JOLIET, ILL.

For running-in new and rebuilt engines use auxiliary lubricants containing "dag" * Brand colloidal graphite.

Acheson Colloids Corporation

Port Huron



Michigan

*REG. U. S. PAT. OFF.

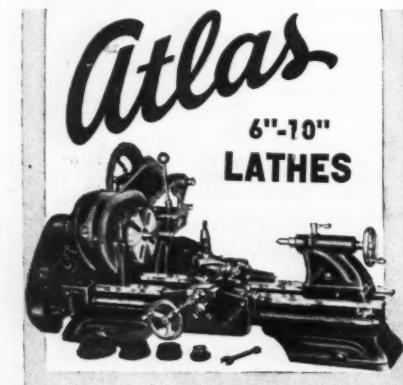
BUY NO
BATTERY
CHARGER

Until You Have Investigated THE VALLEY SUPERDUTY CHARGER

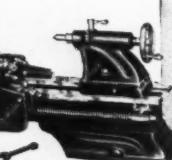
• Fully Guaranteed for Two Years—Valley, modernized superduty chargers will give you the utmost in value . . . enable you to cash in on the big profits in battery charging. Valley chargers are easy to operate . . . no moving parts . . . connecting to the lighting circuit. Low in operating cost. Order yours today.

Model SG-12 charges 1 to 12 6 volt batteries—\$28.00.

Valley Electric Corp.
4221 Forest Park Blvd., St. Louis, Mo.



6"-10"
LATHES



Callahan Appointed Editor

The Chek-Chart Corp., Chicago, announces the appointment of William C. Callahan as managing editor.

Callahan, through his many years' association with automotive publications, has a broad knowledge of all phases of the industry and a wide acquaintance among the automotive, petroleum and related industries.

Chek-Chart also announces the addition to its editorial staff of Thomas M. Ephgrave, formerly in advertising and sales promotion work in Chicago.

Triplex Screw Expands

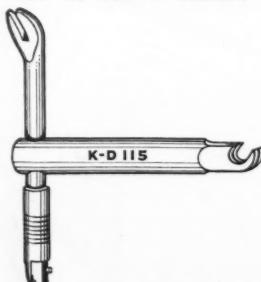
The Triplex Screw Co., Cleveland, Ohio, has completed for occupancy a new building 80 x 100 ft., adjoining its older plant. The new building is the second unit acquired in the last two years and houses additional heat-treating facilities as well as warehouse space. The new batteries of modern electric furnaces step up the production capacity on cap screws and bolts of higher carbon content and greater tensile strength, for which the demand is high in defense manufacturing and automotive fields.

Non-Acid Tinner

Of interest to automobile body repair shops is the announcement by Wan-Na-Tin Distributors, McKnight Bldg., Bloomington, Ill., of a new non-acid liquid tinner. This new tinner is said to contain no free acid to cause sweating or blistering. There can be no gum formations or pin holes in the leaded area caused by gas pockets, the manufacturer claims. Supplied in pint tins with handy applicator, priced at \$1.

Distributor Point Alining Tool

One of the latest items added to the line of special tools manufactured by the K-D Mfg. Co., Lancaster, Pa., is the K-D No. 115, a distributor point alining tool. Designed to service all makes of distributor points, both stationary and breaker arm. The forked end of the T handle adjusts



channel type breaker arms, the end with the sleeve adjusts ribbed high-speed arms, and the milled end of the tool adjusts stationary arms. It is made of special steel and carefully tempered to assure long service.

PAX GASKET CEMENT



A scientific formula of high-grade materials, PAX Red Label GASKET CEMENT is completely heat-resistant and leak-proof.

Remove dirt or grease. Apply 1 or 2 coats of PAX Cement to gasket. Place gasket, fasten in position and job is completed.

Write NOW for details.

JOHN S. MCKENZIE
Manufacturer
Rutherford New Jersey

NEW SpeedWay 1 1/2" No. 89 DRILL

Full size, full weight, full capacity. Specifically wound, high torque 115 V. Universal 500 r.p.m. SpeedWay Drill Motor. Forced air cooling, oilless bearings, new natural grip breast plate and removable side handles. Streamlined die cast case. If your dealer can't supply, order direct on 10 day trial.



SpeedWay Mfg. Co., 1890 S. 52nd Ave., Cicero, Ill.

SAFETY INSURANCE for Auto, Bus, Boat and Truck



Vibrant—Dependable—Custom made to meet a demand. Buell horns increase safety—assure complete satisfaction. Quality horns for every purpose. Sound range up to 10 miles. Send for FREE literature today.

BUELL MANUFACTURING CO.
2973 Cottage Grove Avenue, Chicago, Illinois



7" PORTABLE ELECTRIC SANDER

High speed, general purpose sander. For metal finishing, removing scale and rust, smoothing welds.

THE UNITED STATES
ELECTRICAL TOOL CO.
Cincinnati, Ohio

? DO YOU KNOW ?

... what Pennsylvania motor oil is made in a refinery completely modernized since 1938?

WOLF'S HEAD

100% Pennsylvania 35c a quart
Wolf's Head Oil Refining Co. Oil City, Pa.

HERE'S A HORSE OF A DIFFERENT COLOR

Thermoid
Thermodized
PRE-STRETCHED
FAN
BELTS

STOP TROUBLE BEFORE IT STARTS

BUY
AT THE SIGN
OF THE LION

LION AUTO PARTS & MFG. CO., INC.
1920 S. Michigan Ave., 2214-20 Main St., 1239 Osborne St.,
CHICAGO DALLAS MONTREAL

THERE'S ONLY
1

BURN-OUT PROOF
DIRECTIONAL SIGNAL SWITCH
In complete sets of Signal-Stats or as a
replacement switch—ASK YOUR JOBBER

SIGNAL-STAT CORPORATION
68 JAY STREET BROOKLYN, N.Y.

—TO SPEED UP
SPEED!...

Production on high? Splendid—but without fast, sure deliveries production speed is lost. To speed up your speed, use and specify RAILWAY EXPRESS. Pick-up and delivery at no extra charge within our regular vehicle limits in all cities and principal towns. For service, just phone us.

RAILWAY EXPRESS
AGENCY INC.
NATION-WIDE RAIL-AIR SERVICE

MAIL COUPON
FOR Free
MONEY SAVING
CATALOG...

WAYNE AIR COMPRESSORS
NAME _____
ADDRESS _____
CITY _____ STATE _____
The Wayne Pump Co., Ft. Wayne, Ind.

ANSWERS
to
**What's Wrong
With This Shop**
appearing on Page 41

1. The building looks run down at the heels—it needs a coat of paint.

2. Trash, worn tires, odd bits of metal left lying around the front of the building give it a sloppy, sleepy appearance.

3. The setting of the gasoline pumps on a grade makes it impossible to fill the tanks of the automobiles to capacity.

4. Any alert business man knows that display windows should never be used as stock rooms.

5. Dirty attendant is leaving greasy smears on customer's car.

6. Lubrication rack should be kept clean, and waste oil collected and disposed of instead of being allowed to "run off."

7. Parts and accessory shop should be kept in order—not only to save the men time in looking for items, and in taking stock, but also for the good psychological effect it will have on the customer. An orderly display is much more likely to catch his eye and remind him of items he needs for his car.

8. If the shop were divided into different service sections—washing, lubrication, electrical department, etc., it would permit more efficient handling of the cars, and have a helpful psychological effect on the customer.

9. Wash rack should be over a self-draining floor, so water doesn't run all over the place.

10. Mechanics should always cover car seats with a sheet before getting in with their dirty overalls.

11. What, no waiting room for those two customers standing there?

12. And why the anti-freeze banner when it is obviously summer?

13. And, say, isn't there a rule against smoking?

14. And what good is an empty fire bucket?

15. We hope he doesn't usually let cars go out with a big gasoline mark like that on the fender.

(And we certainly hope your shop doesn't look at all like the one in the drawing.)

TAPERED ROLLER BEARINGS

Tyson

ROLLER BEARING CORP.
MASSILLON, OHIO

DON'T WORRY
I'M SAFE ANYWHERE
I'VE GOT
**SOUTHERN
BRAKE LINING**

SOUTHERN
FRICTION MATERIALS CO. CHARLOTTE, N.C.

Handy
SUPER SERVICER

Quick Charger
Compact portable Tester, Booster and Quick Charger. Tests battery in 1 min. Charges FAST and SAFELY in car. Specify 115 or 230 volts when ordering. Complete with Bulbs, Leads and Clips \$180.00

BALDOR ELECTRIC CO.
4375 Duncan Ave.,
ST. LOUIS, MO.

RIMAC HEX DIES AND TAPS
for a Solid Grip!

Rimac HEXSET has all dies 1" Hex outside for firm grip in die-stock, wrench or ratchet. Tap wrench has 3/8" square tap opening to fit ratchet extensions.

SET No. 77-11 taps, 11 dies, 5/16-1/2" SAE and USS; 1/8" pipe; 9" die stock; tap wrench. Dealer net \$8.50.

Send for Rimac Catalog

RINCK-McILWAINE, INC.
16 HUDSON ST. NEW YORK, N.Y.

TRADE MARK
NOC-OUT
HOSE CLAMPS
WITH THE
THUMB SCREW

For fast, dependable hose connections, use NOC-OUT Hose Clamps, standard in the automotive industry for many years for their leakproof, trouble-free sealing features. Quick tightening thumb screw provides equal pressure all around. Type "A" Adjustable band fits many hose sizes. Type GBB, heavy duty, solid band for Booster Brakes. GSHH for all heater hose. Type HP for all high pressure air and gas lines. Sold by dealers and jobbers everywhere.

WITTEK MFG. CO.
4305 W. 24th PL., CHICAGO, U.S.A.

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